55-1520-227-23-1

TM 55-1520-227-23-1

TECHNICAL MANUAL

AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

ARMY MODEL CH-47B AND CH-47C HELICOPTERS

This copy is a reprint which includes current pages from Changes 1 through 48.

HEADQUARTERS, DEPARTMENT OF THE ARMY

16 AUGUST 1978

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CHANGE }
NO. 48 }

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WASHINGTON, D.C., 23 August 1988

Aviation Unit and Aviation Intermediate Maintenance Manual

ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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1-21 through 1-26	1-21 through 1-26
1-67 and 1-68	1-67 and 1-68
---	1-68.1 and 1-68.2

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Chief of Staff

Official:

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Remove pages	Insert pages
1-103 and 1-104	1-103 and 1-104
1-107 through 1-110	1-107 through 1-110
1-117 through 1-120	1-117 through 1-120
1-123 and 1-124	1-123 and 1-124
1-134.1/1-134.2	1-134.1 and 1-134.2

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NO. 46 }

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ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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1-11 and 1-12	1-11 and 1-12
---	1-12.1/1-12.2
---	1-60.1 and 1-60.2
1-115 and 1-116	1-115 and 1-116
1-123 and 1-124	1-123 and 1-124
1-128.5 and 1-128.6	1-128.5 and 1-128.6
1-129 through 1-132	1-129 through 1-132
1-132.3/1-132.4	1-132.3/1-132.4
2-187 and 2-188	1-187 and 2-188

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1-23 through 1-28	1-23 through 1-28
1-30.1 and 1-30.2	1-30.1 and 1-30.2
1-132.3/1-132.4	1-132.3/1-132.4
2-16.1 through 2-16.5/2-16.6	2-16.1 through 2-16.8
2-17 and 2-18	2-17 and 2-18
2-326.1/2-326.2	2-326.1 through 2-326.13/ 2-326.14
Index 1 and Index 2	Index 1 and Index 2
Index 2.1/2.2	Index 2.1/2.2
Index 3 and Index 4	Index 3 and Index 4
---	Index 12.1/12.2
Index 13 and Index 14	Index 13 and Index 14
Index 15 and Index 16	Index 15 and Index 16

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Remove pages	Insert pages
1-123 and 1-124	1-123 and 1-124
1-128.1 and 1-128.2	1-128.1 and 1-128.2
1-133 and 1-134	1-133 and 1-134
2-389 and 2-390	2-389 and 2-390
---	2-390.1/2-390.2

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Remove pages	Insert pages
1-27 and 1-28	1-27 and 1-28
1-63 and 1-64	1-63 and 1-64
1-97 and 1-98	1-97 and 1-98
1-115 through 1-118	1-115 through 1-118
1-134.1/1-134.2	1-134.1/1-134.2
2-57 and 2-58	2-57 and 2-58
2-129 and 2-130	2-129 and 2-130
2-309 and 2-310	2-309 and 2-310
2-391 through 2-394	2-391 through 2-394
Index 13 and Index 14	Index 13 and Index 14

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1-59 through 1-62	1-59 through 1-62
1-123 and 1-124	1-123 and 1-124
1-128.5 and 1-128.6	1-128.5 and 1-128.6
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1-29 and 1-30	1-29 and 1-30
1-99 and 1-100	1-99 and 1-100
1-103 and 1-104	1-103 and 1-104
1-104.1 and 1-104.2	1-104.1 and 1-104.2
1-109 and 1-110	1-109 and 1-110
1-119 and 1-120	1-119 and 1-120
1-123 and 1-124	1-123 and 1-124

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1-123 and 1-124	1-123 and 1-124

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1-123 and 1-124	1-123 and 1-124

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NO. 39

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Aviation Unit and Intermediate
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ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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- - -	1-80.1/1-80.2

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Remove pages	Insert pages
1-23 and 1-24	1-23 and 1-24
1-103 and 1-104	1-103 and 1-104
1-104.1 and 1-104.2	1-104.1 and 1-104.2
1-123 and 1-124	1-123 and 1-124
1-134.1/1-134.2	1-134.1/1-134.2

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ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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Remove pages	Insert pages
1-123 and 1-124	1-123 and 1-124
1-128.7/1-128.8	1-128.7/1-128.8
1-133 and 1-134	1-133 and 1-134
2-239 and 2-240	2-239 and 2-240
- - -	2-240.1/2-240.2
2-251 and 2-252	2-251 and 2-252
2-257 and 2-258	2-257 and 2-258

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ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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Remove pages	Insert pages
1-1 and 1-2	1-1 and 1-2
1-3 and 1-4	1-3 and 1-4
1-21 through 1-24	1-21 through 1-24
1-29 and 1-30	1-29 and 1-30
1-30.1 and 1-30.2	1-30.1 through 1-30.3/1-30.4
1-85 and 1-86	1-85 and 1-86
1-128.1 and 1-128.2	1-128.1 and 1-128.2
1-128.5 and 1-128.6	1-128.5 and 1-128.6
1-133 and 1-134	1-133 and 1-134
2-103 and 2-104	2-103 and 2-104
2-119 and 2-120	2-119 and 2-120
2-125 and 2-126	2-125 and 2-126
2-193 and 2-194	2-193 and 2-194
---	2-194.1/2-194.2
2-195 and 2-196	2-195 and 2-196
2-208.1/2-208.2	2-208.1/2-208.2
2-295 and 2-296	2-295 and 2-296

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AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL

ARMY MODEL CH-47B AND CH-47C HELICOPTERS

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Remove pages	Insert pages
a and b	a and b
1-1 and 1-2	1-1 and 1-2
1-3 and 1-4	1-3 and 1-4
---	1-4.1/1-4.2
1-5 and 1-6	1-5 and 1-6
1-21 through 1-30	1-21 through 1-30
1-30.1 and 1-30.2	1-30.1 and 1-30.2
1-46.1/1-46.2	1-46.1/1-46.2
1-57 through 1-60	1-57 through 1-60
1-61 and 1-62	1-61 and 1-62
1-99 and 1-100	1-99 and 1-100
---	1-100.1/1-100.2
1-103 and 1-104	1-103 and 1-104
1-104.1/1-104.2	1-104.1 and 1-104.2
1-105 through 1-108	1-105 through 1-108
1-111 and 1-112	1-111 and 1-112
1-117 and 1-118	1-117 and 1-118
1-123 and 1-124	1-123 and 1-124
1-128.3 and 1-128.4	1-128.3 and 1.128.4
1-128.7/1-128.8	1-128.7/1-128.8
1-129 through 1-132	1-129 through 1-132
1-132.1 through 1-132.3/1-132.4	1-132.1 through 1-132.3/1-132.4
1-133 and 1-134	1-133 and 1-134

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Remove pages	Insert pages
1-15 and 1-16	1-15 and 1-16
1-33 and 1-34	1-33 and 1-34
1-34.1/1-34.2	---
1-45 and 1-46	1-45 and 1-46
1-104.1/1-104.2	1-104.1/1-104.2
1-128.1 and 1-128.2	1-128.1 and 1-128.2
1-128.5 and 1-128.6	1-128.5 and 1-128.6
1-133 and 1-134	1-133 and 1-134
1-134.1/1-134.2	1-134.1/1-134.2
2-329 and 2-330	2-329 and 2-330
2-330.1/2-330.2	---
2-333 and 2-334	2-333 and 2-334
2-335 through 2-342	2-342
2-375 and 2-376	2-375 and 2-376
2-387 and 2-388	2-387 and 2-388

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1-31 and 1-32	1-31 and 1-32
1-103 and 1-104	1-103 and 1-104
---	1-104.1/1-104.2
1-109 and 1-110	1-109 and 1-110
---	1-110.1/1-110.2
1-113 and 1-114	1-113 and 1-114
1-117 through 1-122	1-117 through 1-122
1-133 and 1-134	1-133 and 1-134

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WARNING

Personnel performing instructions involving operations, procedures, materials, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings and precautionary information can cause serious injury or death.

Warnings, cautions, and notes emphasize important and critical instructions. They are defined as follows:

WARNING

An operating procedure or practice which, if not correctly followed, will result in personnel injury or loss of life.

CAUTION

An operating procedure or practice which, if not strictly observed, will result in damage or destruction of equipment.

NOTE

An operating procedure or condition which it is essential to highlight.

Dangerous Static Charges. Ground the helicopter during parking, fueling, or defueling.

Dangerous Voltages Exist in the Electronic Equipment. Be careful when working on the 150- and 300-volt dc circuits and on the ac generator 115- and 200-volt ac output.

Dangerous Voltages May Exist at Antenna Terminals. Be careful when working near the antenna or the antenna terminals. Radio-frequency (rf) high voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

Poisonous Carbon Monoxide Fumes. Toxic carbon monoxide fumes may be present inside the helicopters whenever the apu or engines are operating with the cargo ramp open. Ventilate the cockpit.

Dangerous Fuel Handling. Incorrect fuel handling causes fire hazards. Ground the helicopter when fueling or defueling.

Dangerous Chemicals Used in Nickel-Cadmium Batteries. The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic chemical agent. Serious and deep burns of body tissue will result if the electrolyte comes in contact with the eyes or any part of the body. Use rubber gloves, rubber apron, and protective eye covering when handling the battery. If accidental contact with the electrolyte is made, use ONLY clean water and immediately (seconds count) flush contaminated areas. Continue flushing with large quantities of clean water. Seek medical attention immediately. Before removing or installing the battery, insure that the battery switch is off and the battery has cooled down if overheated. Removal or installation of the battery connector while the battery is under load may result in explosion, electrical arcing, and possible severe burns to personnel. Take every possible step to keep the nickel-cadmium battery as far away as possible from the lead-acid type battery. Do not use the same tools and materials (screwdrivers, wrenches, gloves, apron, etc.) for both types of batteries. Anything associated with the lead-acid battery, even the air, must never come in contact with the nickel-cadmium battery or its electrolyte. Even a trace of sulphuric acid fumes from a lead-acid battery may result in damage to the nickel-cadmium battery. If sulphuric acid has been inadvertently mixed with the electrolyte in the battery, the upper areas of the cells will appear greenish in color. In such cases, the battery must be replaced.

Corrosive Battery Electrolyte (Potassium Hydroxide). Wear rubber gloves, apron, and face shield when handling leaking batteries. If potassium hydroxide is spilled on clothing, or other material, wash immediately with clean water. If personal contact is made, immediately start flushing the affected area with clean water. Continue washing until medical assistance arrives.

Acids and Alkalines. Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Ruststripper is an alkaline solution. Avoid contact with the skin. Wear protective clothing. Wash thoroughly after using.

Solvent and Cleaning Solutions. These materials are generally toxic and many (toulene, benzene, xylene, methyl-ethyl-ketone, percholorethylene, naphtha, trichloroethylene) are highly flammable. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

Windshield Repellant. Do not let windshield rain repellant contact open flame. Deadly hydrogen fluoride gas could be generated. Wash hands with soap and water after handling repellant.

Antiseize Compounds. Some antiseize compounds are irritants. Avoid inhaling fumes and contact with the skin. Wear protective clothing. Wash thoroughly after using.

Paints, Varnishes, Dopes, Thinners, Lubricants, and Fuels. These materials are generally highly flammable and may be irritants. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin. Wash thoroughly after using.

Epoxy Resins, Cements, and Adhesives. These materials may contain toxic or irritating substances. They may also be flammable. Work in a well ventilated area away from open flames. Wear protective clothing. Avoid contact with the skin. Wash thoroughly after using.

Radiation Hazard. Some instruments contain radioactive material. (See TB 55-1500-314-25.) Do not try to disassemble these instruments. They present no radiation hazard unless seal is broken. If you think seal is broken, do not remove instrument from aircraft until you consult Base Radioactive Protective Officer (AR 40-14). Use a beta-gamma radiac meter AN/PDR-27 or equivalent to determine if instrument contains radioactive material (radium).

Fire Extinguishing Agents. Avoid repeated or prolonged exposure to high concentration of monobromotrifluoromethane (CF_3Br) or decomposition products. CF_3Br is a narcotic agent of moderate intensity but prolonged duration. It is less toxic than carbon tetrachloride, methylbromide, or products of combustion. Take normal precautions while using CF_3Br. Use oxygen masks when available. CF_3Br is highly volatile but it is not easily detected by its odor. Although nontoxic, it is about the same as other freons and carbon dioxide, causing danger to personnel primarily by reduction of oxygen available for proper breathing. Do not allow the liquid to come into contact with your skin. It may cause frostbite or low temperature burns.

Noise. Sound pressure levels in this aircraft during some operating conditions exceed the Surgeon General's hearing conservation criteria, as defined in TB MED 251. Hearing protection devices, such as the aviator helmet or ear plugs, are required to be worn by all personnel in and around the aircraft during its operation.

FOD. Make sure area is clear of foreign objects before closing access doors, panels, and fairings. If the area is not cleared, damage to components and systems could result in personal injury or death.

Light Sensitive Lenses. Do not wear eyeglasses having light sensitive lenses while performing magnetic particle (black light) or fluorescent penetrant inspections. Such lenses have a 16 to 45 percent light transmission loss, and wearing them can result in failure to detect flaws and cracks under ultraviolet light.

Maintenance Platforms/Workstands. Use only appropriate maintenance platforms/workstands illustrated in TM 55-405-10, or other approved locally procured stands and restraint equipment, when working above 10 feet on helicopters in a nontactical environment. Otherwise, personnel injury could result from accidental falls.

Handling Hydraulic Fluid. When handling hydraulic fluid (MIL-H-83232), observe the following:

- Prolonged contact with liquid or mist can irritate eyes and skin.
- After any prolonged contact with skin, immediately wash contacted area with soap and water. If liquid contacts eyes, flush them immediately with clear water.
- If liquid is swallowed, do not induce vomiting; get immediate medical attention.
- Wear rubber gloves when handling liquid. If prolonged contact with mist is likely, wear an appropriate respirator.
- When fluid is decomposed by heating, toxic gases are released

Tools. Use only chrome plated steel or unplated steel tools for disassembly or reassembly procedures described in this manual. Use of cadmium or zinc plated tools is not permitted since these platings are prone to chipping and flaking. Should these chips or flakes becomes embedded in aircraft parts, galvanic corrosion will result. Should these chips or flakes enter fuel or oil wetted components, they may eventually clog the filter or produce intergranular attack of nickel or titanium base alloys at elevated temperatures. All tools, regardless of type plating, should be serviceable and free of chipping.

* TM 55-1520-227-23-1

TECHNICAL MANUAL

No. 55-1520-227-23-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 16 August 1978

Aviation Unit and Aviation Intermediate Maintenance Manual

ARMY MODEL CH-47-B AND CH-47C HELICOPTERS

NOTE

This manual is printed in five volumes, as follows:

TM 55-1520-227-23-1, consisting of Table of Contents, Preface, Chapter 1 and Chapter 2.

TM 55-1520-227-23-2, consisting of Table of Contents, Chapters 3 through 6.

TM 55-1520-227-23-3, consisting of Table of Contents, Chapters 7 through 9.

TM 55-1520-227-23-4, consisting of Table of Contents, Chapters 10 through 17.

TM 55-1520-227-23-5, consisting of Table of Contents, Appendix A through G.

The Preface and Appendices are applicable to volumes 1 through 5.

***This manual together with TM 55-1520-227-23-2, 16 August 1978, TM 55-1520-227-23-3, 16 August 1978, TM 55-1520-227-23-4, 16 August 1978, and TM 55-1520-227-23-5, 16 August 1978, supersedes TM 55-1520-227-20-1, 3 August 1973, TM 55-1520-227-20-2, 3 August 1973, TM 55-1520-227-34-1, 20 July 1973, TM 55-1520-227-34-2, 3 August 1973 and TM 55-1520-227-34-3, 3 August 1973, including all changes.**

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Aviation Unit and Aviation Intermediate Maintenance Manual

ARMY MODEL
CH-47B/C HELICOPTER

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, U.S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Boulevard, St. Louis, Missouri, 63120. A reply will be furnished to you.

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PREFACE

Scope.

Maintenance of Army aircraft is transitioning to three levels of maintenance. These maintenance levels are Aviation Unit Maintenance (AVUM); Aviation Intermediate Maintenance (AVIM) and Depot maintenance. AVUM and AVIM maintenance will replace organizational, direct support, and general support maintenance. In the interim, as maintenance units are reorganized and/or amalgamated into three level maintenance activities, this publication will be used by AVUM or AVIM/Direct Support/General Support and Depot Maintenance on the complete airframe, its components and systems.

A table of contents is provided at the front of this manual to assist in determining the chapter in which individual functions are covered. The study and use of this manual will enable applicable maintenance crews to perform the assigned functions with maximum efficiency.

Quality Assurance/Quality Control.

Quality assurance/quality control personnel shall assure that proper maintenance has been performed by verifying that dimensions and tolerances contained in this manual have been met. Inspection of completed work for full compliance with the technical requirements of the instructions shall be accomplished by qualified personnel in accordance with an approved prescribed inspection system. The inspection system shall be determined on the basis of instructions issued at the worksite.

Description.

CH-47B and CH-47C helicopters are tandem rotor cargo helicopters with a semimonocoque fuselage. The helicopter is powered by two T55-L-7B, T55-L-7C, or T55-L-11 series engines in nacelles on the aft cabin fuselage section. Torque from the engines is transmitted to rotary-wing blades thru a series of mechanical transmission. These transmissions are interconnected by a system of synchronizing drive shafts. Each rotor system consists of a rotary-wing head and three rotary-wing blades. The rotor systems are controllable from the cockpit by both the pilot and co-pilot thru dual hydraulic-boosted control systems. The helicopter is equipped with a quadricycle landing gear, with dual wheels on each forward landing gear and a single wheel on each aft landing gear. Each aft gear can swivel 360°. Power steering is connected to the right aft gear. A hydraulically operated cargo ramp and door is incorporated in the aft end of the fuselage. A hydraulically operated rescue and cargo handling winch is located in the forward cabin area. An auxiliary power unit mounted above the cargo ramp area in the aft pylon permits operation of all helicopter systems without the use of ground power source.

Destruction of Army Material to Prevent Enemy Use.

For destruction of Army Material to Prevent enemy use, refer to TM 750-244-1-5.

Maintenance of Forms and Records.

Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

Authority for Substitution.

Substitution or interchange or items of material for maintenance of Department of the Army aircraft shall not be authorized, nor shall orders be issued for shipment. Substitution or interchangeability shall be authorized only by U.S. Army Troop Support and Aviation Materiel Readiness Command.

Special Tools and Equipment.

Special tools and test equipment used in accompanying maintenance tasks are listed in this manual.

Calibration.

Within the scope of this manual there are no helicopter components, accessories, or instruments that require calibration. Special tools and test equipment shall be calibrated as specified in TB 750-25, Army Metrology and Calibration System.

Storage.

Storage requirements for helicopter components are in Appendix E. Refer to TM 740-90-1 and TM 55-1500-204-25/1 for additional requirements.

Designator Codes (Effectivity Codes).

In those cases where information in this manual applies only to certain helicopter models or configurations, the limited applicability is indicated by reference to effectivity codes. An explanation of these codes is in table 1.

Table 1. Effectivity Codes

CODE	HELICOPTER SERIAL NO.	MODEL
H.4	66-19098 thru 66-19143	B
I	67-18432 thru 67-18551	B & C
I.1	67-18432 thru 67-18493	B
I.2	67-18494 thru 67-18551	C
J	68-15810 thru 68-15869	C
	68-15990 thru 68-16022	C
J.1	68-15810 thru 68-15828	C
J.2	68-15829 thru 68-15857	C
J.3	68-15858 thru 68-15869	C
	68-15990 thru 68-16022	C
K	69-17100 thru 69-17126	C
L	70-15000 thru 70-15023	C
M	70-15024 thru 70-15035	C
N	71-20944 thru 71-20953	C
N.1	71-20944 thru 71-20950	C
N.2	71-20951 thru 71-20955	C
O	74-2227 thru 74-22276	C

Explanation of Change Symbols.

Changes, except as noted below, to the text and tables, including new material on added pages, are indicated by a vertical line in the outer margin extending close to the entire area of the material affected; exception: pages with emergency markings, which consist of black diagonal lines around three edges, may have the vertical line or change symbol placed along the inner margins. Symbols show current changes only. A miniature pointing hand symbol is used to denote a change to an illustration. However, a vertical line in the outer margin, rather miniature pointing hands, is utilized when there have been extensive changes made to an illustration. Change symbols are not utilized to indicate changes in the following:

a. Introductory material.

b. Indexes and tabular data where the changes cannot be identified.

c. Blank space resulting from the deletion of text, an illustration, or a table.

d. Correction of minor inaccuracies, such as spelling, punctuation, relocation of material, etc., unless such correction changes the meaning of instructive information and procedures.

CHAPTER 1

AIRCRAFT GENERAL

SECTION I SERVICING

1. Replenishment.

Helicopter fluid replenishment instructions are in para 1-2 thru 1-24. Servicing materials and unit capacities are in table 1-1. For additional information, see fig. 1-1 and 1-2 and refer to TM 55-1520-227-10-1 and -2.

1-2. Fuel System—Power Off. (Figure 1-1). Service the fuel tanks as follows:

WARNING

Fuel quantity markings (in pounds) are painted on the inside of the fuel tank to aid in servicing. Use an explosion-proof flashlight when checking fuel quantity in this manner.

NOTE

Servicing personnel shall comply with all safety precautions and procedures in FM 10-68.

a. Position the helicopter at least 50 feet from any hangar or structure.

b. Park the refueling vehicle a minimum of 10 feet from the helicopter and out of the blade area during fueling.

c. Be sure battery switch is in the OFF position and external power is disconnected before refueling the helicopter.

d. Ground the helicopter (paragraph 1-86).

e. Remove the fuel tank filler cap.

f. Fill the tank with fuel (C158) to the required level. On CH-47C, service main tanks before auxiliary tanks.

g. Install the filler cap.

h. Remove ground connections. If the helicopter is to remain parked, do not remove the ground connection from the helicopter.

1-3. Engine Oil System. (See fig. 1-1.) Service either engine oil system as follows:

CAUTION

Do not use AN/ARC-102 antenna standoffs as handholds. Damage to standoffs will result.

CAUTION

If the engine has not been operated in the preceding 24 hours, it should be run before oil level is checked. (Refer to TM 55-1520-227-10-1 or -2.) Otherwise, an inaccurate oil level may be indicated.

a. Open the access panel on the forward left side of the engine cover. Check oil level on indicator.

b. If the indicator shows less than full, open the oil filler access panel on the forward top side of the engine cover.

CAUTION

There is no easily recognized difference in appearance between the two types of oil. The only way of determining which type of oil is in an engine is by careful maintenance of servicing records.

c. Oil (C225) is preferred for ambient temperatures above -25°F (-32°C). Use oil (C226) for temperatures below −25°F (−32°C). Under normal conditions, engines shall be serviced with one type of oil only. If one type of oil is in an engine and that oil is not available, the other type may be used in an emergency. If two types of oil are mixed, the engine oil shall be changed and the system flushed within 6 hours of engine operation. (Refer to para 4-257 or 4-258.)

CAUTION

Synthetic oils, such as oil (C225) and oil (C226) can soften paint or stain clothing upon contact. If synthetic oil is spilled on painted surfaces, those surfaces should be cleaned immediately. Skin should be thoroughly washed after contact and saturated clothing should be removed immediately. Prolonged skin contact with synthetic oils may cause a skin rash. Areas where synthetic oils are used should have adequate ventilation to keep mist and fumes to a minimum.

CAUTION

Lubrication oil made to MIL-L-7808 by the Shell Oil Company under their part number 307, qualification number 7D-1, contains additives that are harmful to seals made of silicone. Therefore, Shell Oil 307 shall not be used in those engines and transmissions which contain silicone seals. These components are the engine, all transmissions, and rotor head oil reservoirs.

d. Remove the filler cap. Fill the tank with oil (C225) or (C226) until the indicator shows full. Do not overfill tank.

e. Install the filler cap. Close both access panels.

f. If oil was changed from one type to another, change the stencil on the engine cowl to show the proper type.

Table 1-1. Servicing Materials and Unit Capacities

				CAPACITY	
UNIT OF SYSTEM	MATERIAL	ITEM	UNIT	US	IMP.
Fuel Tank, Each (CH-47B) Without Crash Resistant Fuel System	Jet Fuel	C158	GAL	310.00	258.33
Fuel Tank, Each (CH-47B) With Crash Resistant Fuel System	Jet Fuel	C158	GAL	Left 287.00 Right 280.00	239 234
Fuel Tank, Main, Each (CH-47C) With Crash Resistant Fuel System	Jet Fuel	C158	GAL	Left 287.00 Right 280.00	239 234
Fuel Tank, Auxiliary, Forward (CH-47C) With Crash Resistant Fuel System	Jet Fuel	C158	GAL	Left 119.00 Right 122.00	99.5 99.5
Fuel Tank, Auxiliary, Aft, (CH-47C) With Crash Resistant Fuel System	Jet Fuel	C158	GAL	Left 119.00 Right 120.00	99.5 101
Engine, Each	Lubricating Oil	C225 or C226	QT	14.0	11.62
Apu	Lubricating Oil	C225 or C226	QT	3.00	2.50
Forward Rotary-Wing Drive Xmsn System	Lubricating Oil	C225 or C226	QT	29.00	24.15
Aft Rotary-Wing Drive Xmsn System	Lubricating Oil	C225 or C226	QT	36.00	30.00
Engine Xmsn and Engine Combining Xmsn System	Lubricating Oil	C225 or C226	QT	39.00	32.48
Pitch-Varying Housing and Oil Tank	Lubricating Oil	C226	QT	0.37	0.30
Rotary-Wing Hub and Oil Tank	Lubricating Oil	C226	QT	1.00 (calculated)	0.83
Vertical Hinge Pin Bearings and Oil Tank	Lubricating Oil	C226	QT	0.34	0.28
Controllable Swashplate Bearings	Grease	C162	—	—	—
Shock Absorber (CH-47B)	Hydraulic Fluid	C175	QT	0.72	0.60
Shock Absorber (CH-47C)	Hydraulic Fluid	C175	QT	0.74	0.62
Landing Gear Shock Strut, Forward	Hydraulic Fluid	C175	QT	3.20	2.65
Landing Gear Shock Strut, Aft	Hydraulic Fluid	C175	QT	1.30	1.04
Flight Controls Hydraulic Fluid Tank, Each	Hydraulic Fluid	C175 or C177	QT	5.25	4.37
Utility Hydraulic Fluid Tank (Ramp Up)	Hydraulic Fluid	C175 or C177	QT	6.35	5.28

WARNING

When handling hydraulic fluid (MIL-H-83282) observe the following:

- Prolonged contact with liquid or mist can irritate eyes and skin.
- After any prolonged contact with skin, immediately wash contacted area with soap and water. If liquid contacts eyes, flush them immediately with clear water.
- If liquid is swallowed, do not induce vomiting; get immediate medical attention.
- Wear rubber gloves when handling liquid. If prolonged contact with mist is likely, wear an appropriate respirator.
- When fluid is decomposed by heating, toxic gases are released.

1-4. Auxiliary Power Unit (Apu) Oil System. (See fig. 1-1.) Service the apu as follows:

CAUTION

Do not use the apu drip pan as a handhold. Damage to equipment will result.

a. Remove the filler cap from left side of apu.

CAUTION

There is no easily recognized difference in appearance between the two types of oil. The only way of determining which type of oil is in an apu is by careful maintenance of servicing records. Do not overfill. Damage to the apu can result from overfilling.

b. Add oil (C225) or (C226) as applicable to the apu oil tank until the oil level reaches the FULL mark on the sight gage or dipstick. Use oil (C225) for ambient temperatures above −25°F (−32°C). Use (C226) for temperatures below −25°F (−32°C). Under normal conditions, the apu shall be serviced with one type of oil only. If one type of oil is in an apu and that oil is not available, the other type may be used in an emergency. If the two types of oil are mixed, the oil shall be changed and the system flushed within 6 hours of apu operation.

c. Reinstall the filler cap.

1-5. ***Apu Oil Consumption Rate***. The maximum allowable oil consumption rate is 1.7 US fluid ounces per hour. If oil consumption exceeds this rate, perform an inspection to determine the cause. Check the oil consumption rate as follows:

a. Determine the amount of oil required to bring the oil level to the FULL mark. Use a suitable container calibrated in fluid ounces.

b. Record the amount of oil added and the hours that the apu has operated since it was last serviced.

c. Divide the amount of oil added by hours to determine the oil consumption rate.

1-6. *Transmission Oil System.* (See fig. 1-1.)

CAUTION

If the engine has not been operated in the preceding 24 hours, it should be run before oil level is checked. (Refer to TM 55-1520-227-10-1 or -2.)

Fill the forward, aft, engine and combining transmissions with oil (C225 or C226) to the FULL level indicated on the sight gage retainers. Either type oil may be used for ambient temperatures above -25°F (-32°C). C226 type oil must be used at ambient temperatures below -25°F (-32°C). Under normal conditions, transmissions shall be serviced with one oil only. If one type oil is in a transmission, and that type is not available, the other type may be used in an emergency. If two type oils are mixed, the transmission oil shall be changed and the system flushed within six hours of transmission operation.

a. If the helicopter is not parked on level ground and cannot be leveled by jacking or other means, the following steps are recommended for servicing:

(1) Position the helicopter so that it is headed directly up slope.

(2) Drain the oil from the forward and aft transmissions. (Refer to para 6-137 and 6-263.) Drain the oil from the combining and engine transmission oil tank. (Refer to para 6-210.)

(3) Refill all transmissions to sump or tank capacity as stenciled in the vicinity of the filler caps. Capacities are also given in table 1-1. Disregard FULL lines on the sumps or tank sight gages in this case only. If system lines have been drained, refill the transmission to system capacity.

b. Access to oil filler and the location of the sight gage of each transmission are as follows:

(1) The oil filler and sight gage for the forward transmission are accessible within the hinged fairing on the right side of the forward pylon. The filler neck is in the top forward area of the transmission and the sight gage is in the bottom aft area.

(2) The oil filler for aft transmission is in the left side of aft pylon section. It is accessible thru an access panel at sta 555. The sight gage is on the forward right side of the transmission sump. It is accessible from the cargo ramp area.

(3) The oil filler and sight gages for the combining transmission and both engine transmissions are on combining transmission oil tank. They are accessible within the fairing of the aft pylon leading edge.

1-7. *Rotary-Wing Hub Oil Tank.* (See fig. 1-1 and 1-11.)

Service the forward or aft rotary-wing hub oil tank as follows:

a. Position the rotor head so that one of the three sight gages on the hub oil tank faces directly to the left or right side of the helicopter.

b. Check the oil level at the sight gage.

c. If the oil level is below half full, remove the lockwire and plug which are uppermost on the hub oil tank.

d. Fill hub oil tank with oil (C226) until the oil level is midway in the sight gage.

e. Reinstall the plug into the hub oil tank. Lockwire the plug. Use lockwire (C206).

f. After servicing the oil tank of a system or component that has been drained, run the rotor system for 5 minutes. Recheck the sight gage and fill the tank as required.

1-8. *Rotary-Wing Pitch-Varying Bearing Oil Tanks.* (See fig. 1-1 and 1-11.)

Service any one of the pitch-varying bearing oil tanks as follows:

a. Position the pitch-varying housing so that it points directly forward. Check either sight gage to determine the oil level.

NOTE

The pitch-varying housing shall point forward in order to read a mean level in tank and to prevent oil from spilling out when plug is removed from tank.

b. If the oil level is below half full, remove the lockwire and plug.

c. Fill the pitch-varying bearing oil tank with oil (C226) until oil level is midway in sight gage.

d. Install the plug in the tank. Lockwire the plug. Use lockwire (C206).

e. Service each of the other pitch-varying housings. (Refer to steps a. thru d.)

f. After servicing the oil tank of a system or component that has been drained, run the rotor system for 5 minutes. Recheck sight gage. Fill tank as required.

1-9. *Rotary-Wing Vertical Pin Bearing Oil Tank.* (See fig. 1-1 and 1-11.)

a. Turn the rotary-wing head until the oil levels in the two sight gages of the vertical pin bearing oil tank are level.

b. If oil occupies less than half of the area of both sight gages, remove the lockwire and upper plug from the tank.

c. Service the tank with oil (C226) until oil fills half of both sight gages.

d. Install the plug into the tank. Lockwire the plug to the housing. Use lockwire (C206).

e. Service each of other vertical pin bearing oil tanks. (Refer to steps a. thru d.)

f. After servicing oil tank of a system or component that has been drained, run rotor system for 5 minutes. Recheck the sight gage and fill the tank as required.

1-10. Rotary-Wing Shock Absorber. (See fig. 1-1.)

a. Service 114H5900 series absorbers as follows:

(1) Check sight gage on the shock absorber. Make sure fluid is between the upper and lower fluid level lines.

(2) If fluid level is below the lower line, remove lockwire and filler plug from the top of the gage housing.

(3) If fluid can be seen below the lower line, add hydraulic fluid (C175). Bring the fluid level to the upper line. Reinstall and lockwire the filler plug. Use lockwire (C206).

(4) If fluid cannot be seen below the lower line, add fluid to bring the level to the upper line. Bleed the shock absorber. (Refer to para 5-120.)

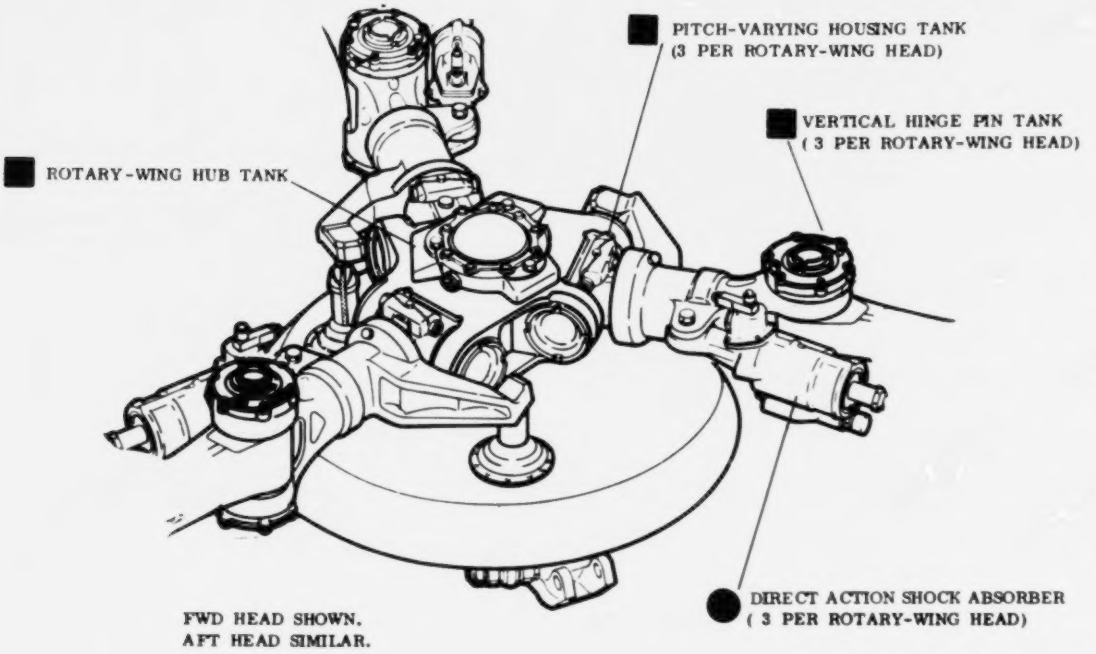
b. Service 114H6800 series absorbers as follows:

(1) Position the blades so that the absorber being serviced is level.

NOTE

The absorber is about level when it is 90° from fuselage centerline.

(2) Check the fluid level in sight indicator. Make sure fluid is within the indicator bull's-eye.


■ PITCH-VARYING HOUSING TANK (3 PER ROTARY-WING HEAD)
■ VERTICAL HINGE PIN TANK (3 PER ROTARY-WING HEAD)
■ ROTARY-WING HUB TANK
FWD HEAD SHOWN. AFT HEAD SIMILAR.
● DIRECT ACTION SHOCK ABSORBER (3 PER ROTARY-WING HEAD)

NOTE

FIBERGLASS ROTOR BLADE CONFIGURATION SHOWN. SERVICING OF METAL ROTOR BLADES IS IDENTICAL.

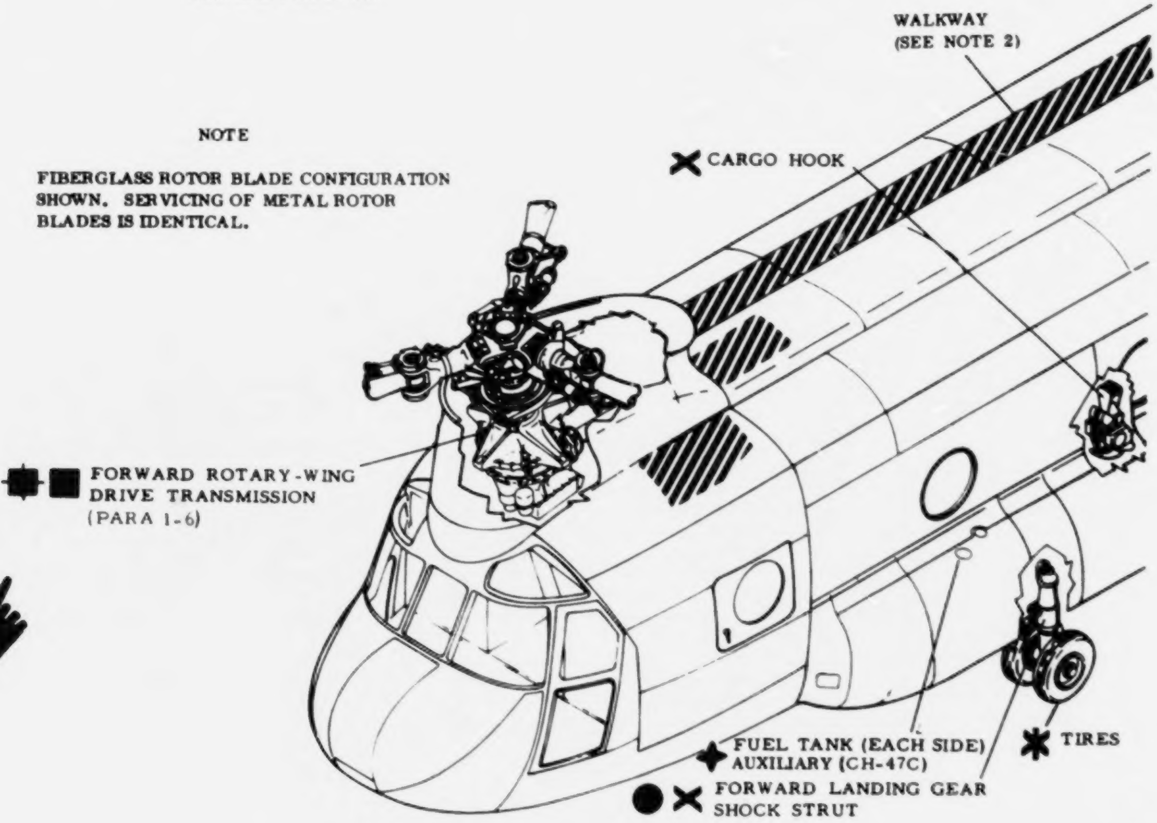
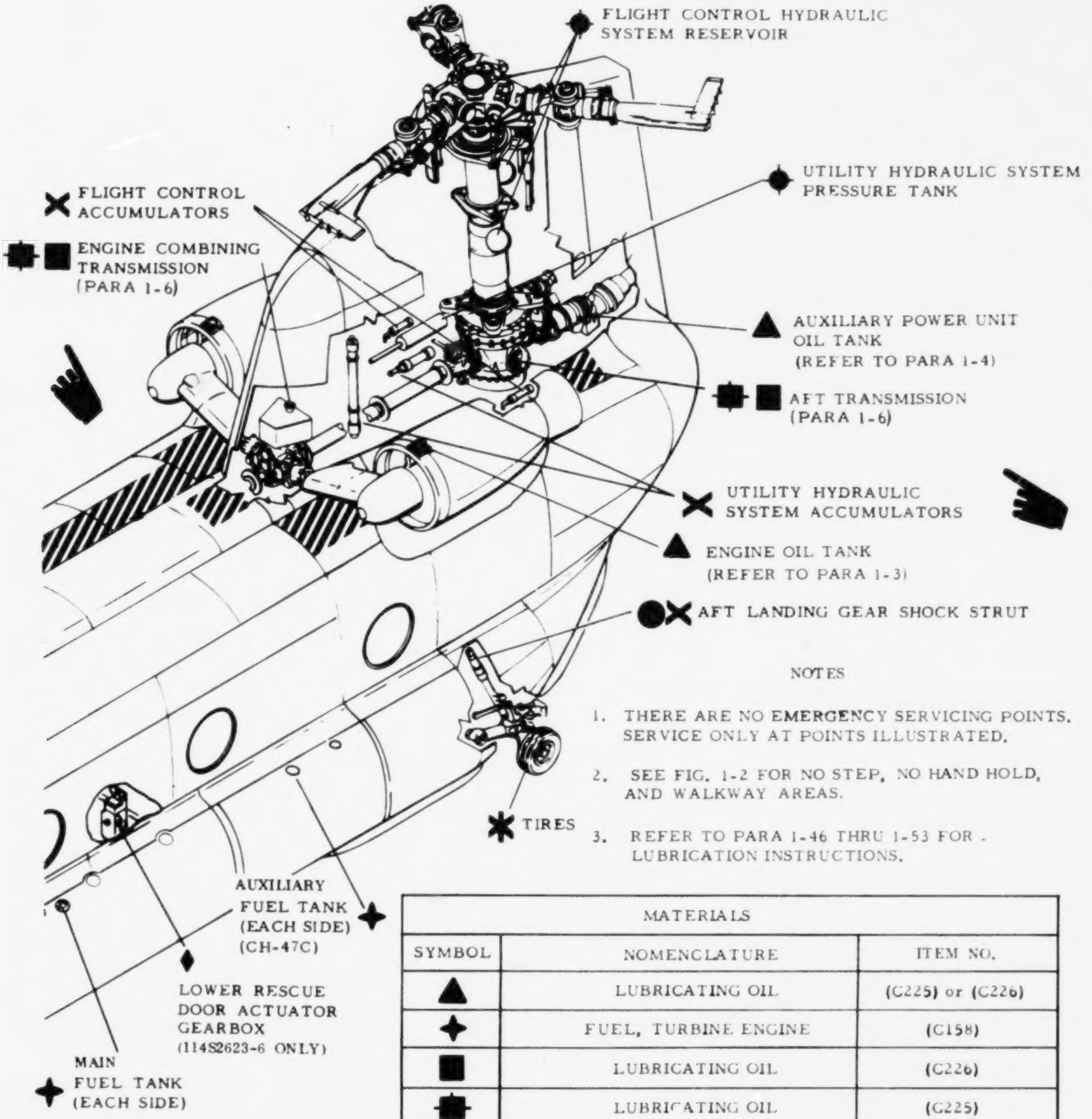

WALKWAY (SEE NOTE 2)
✕ CARGO HOOK
✚ ■ FORWARD ROTARY-WING DRIVE TRANSMISSION (PARA 1-6)
✚ FUEL TANK (EACH SIDE) AUXILIARY (CH-47C)
✱ TIRES
● ✕ FORWARD LANDING GEAR SHOCK STRUT

Figure 1-1. Servicing Diagram (Sheet 1 of 2)

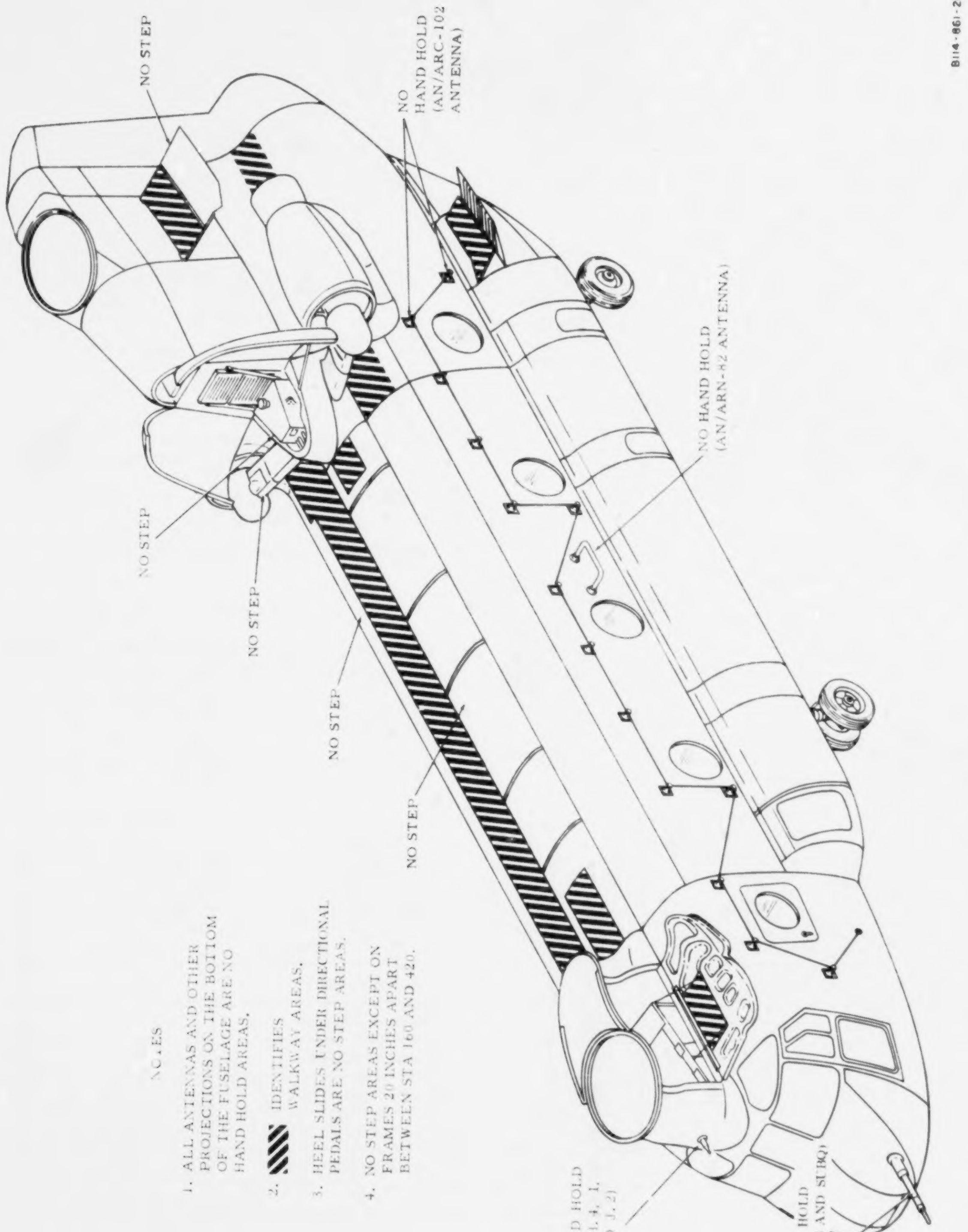

FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR
FLIGHT CONTROL ACCUMULATORS
ENGINE COMBINING TRANSMISSION (PARA 1-6)
UTILITY HYDRAULIC SYSTEM PRESSURE TANK
AUXILIARY POWER UNIT OIL TANK (REFER TO PARA 1-4)
AFT TRANSMISSION (PARA 1-6)
UTILITY HYDRAULIC SYSTEM ACCUMULATORS
ENGINE OIL TANK (REFER TO PARA 1-3)
AFT LANDING GEAR SHOCK STRUT
TIRES
AUXILIARY FUEL TANK (EACH SIDE) (CH-47C)
LOWER RESCUE DOOR ACTUATOR GEARBOX (114S2623-6 ONLY)
MAIN FUEL TANK (EACH SIDE)

NOTES

1. THERE ARE NO EMERGENCY SERVICING POINTS. SERVICE ONLY AT POINTS ILLUSTRATED.
2. SEE FIG. 1-2 FOR NO STEP, NO HAND HOLD, AND WALKWAY AREAS.
3. REFER TO PARA 1-46 THRU 1-53 FOR LUBRICATION INSTRUCTIONS.

MATERIALS		
SYMBOL	NOMENCLATURE	ITEM NO.
▲	LUBRICATING OIL	(C225) or (C226)
✦	FUEL, TURBINE ENGINE	(C158)
■	LUBRICATING OIL	(C226)
▣	LUBRICATING OIL	(C225)
✕	AIR/NITROGEN	NONE
●	HYDRAULIC FLUID	(C175)
⊕	HYDRAULIC FLUID	(C175) or (C177)
♦	LUBRICATING OIL	(C228)
✱	AIR	NONE

Figure 1-1. Servicing Diagram (Sheet 2 of 2)


NO STEP
NO HAND HOLD (AN/ARC-102 ANTENNA)
B114-861-20H
NO HAND HOLD (AN/ARN-82 ANTENNA)
NO STEP
NO STEP
NO STEP
NO STEP
NO HAND HOLD (CODE H.4, J, J.1 AND J.2)
NO HAND HOLD (CODE J.3 AND SUBQ)
50436

NO.ES

1. ALL ANTENNAS AND OTHER PROJECTIONS ON THE BOTTOM OF THE FUSELAGE ARE NO HAND HOLD AREAS.
2. ▨ IDENTIFIES WALKWAY AREAS.
3. HEEL SLIDES UNDER DIRECTIONAL PEDALS ARE NO STEP AREAS.
4. NO STEP AREAS EXCEPT ON FRAMES 20 INCHES APART BETWEEN STA 160 AND 420.

Figure 1-2. No Step, No Handhold, and Walkway Areas (Sheet 1 of 2)

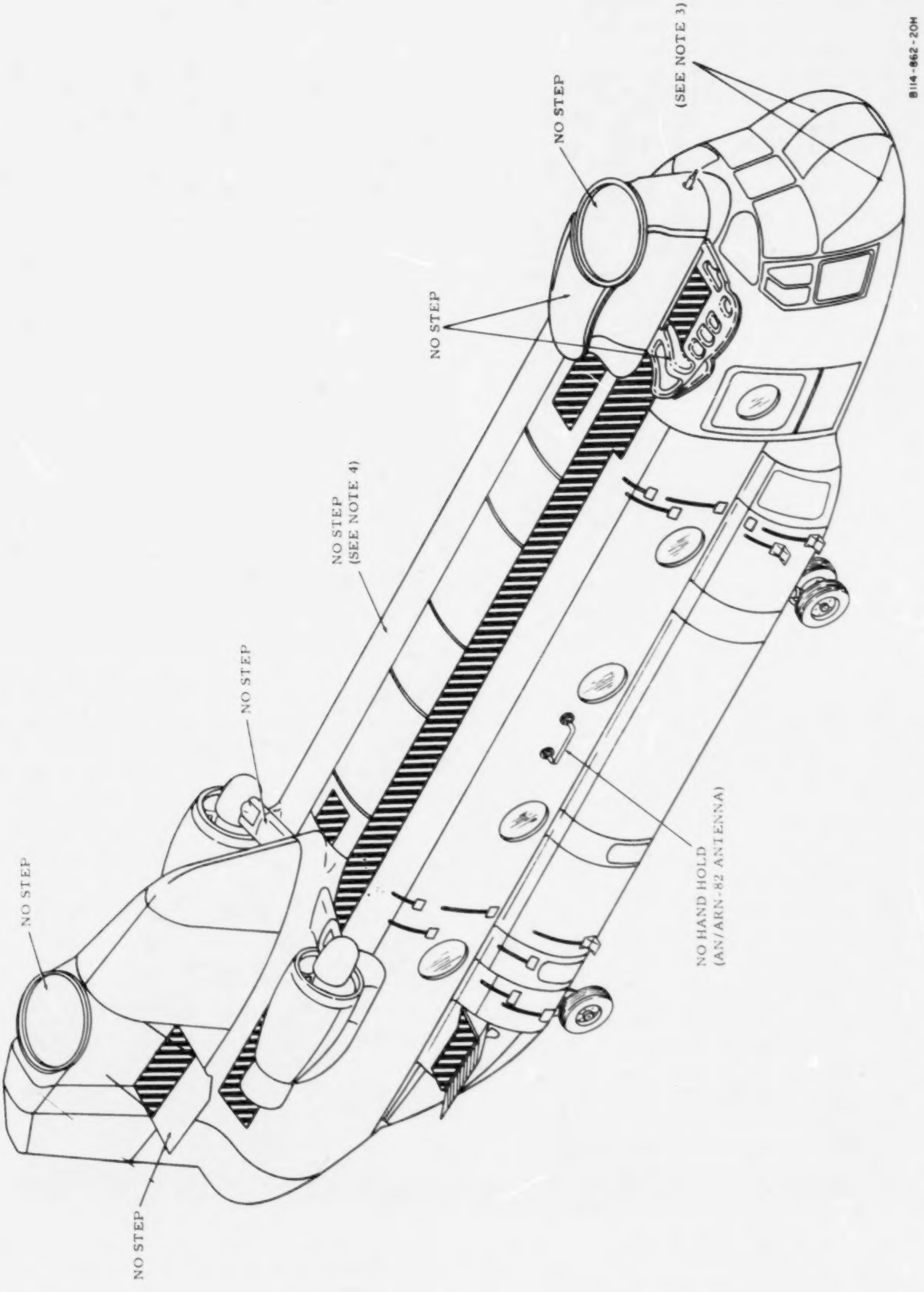

NO STEP
NO STEP
NO STEP
NO STEP
(SEE NOTE 4)
NO STEP
NO STEP
(SEE NOTE 3)
NO HAND HOLD
(AN/ARN-82 ANTENNA)
B114-862-20H

Figure 1-2. No Step, No Handhold, and Walkway Areas (Sheet 2 of 2)

(3) If the fluid level is not visible in the bull's-eye, remove the lockwire and filler plug from fluid tank.

(4) Add a small amount of hydraulic fluid (C175).

(5) If fluid shows in the indicator, add fluid to bring level to midpoint of bull's-eye. Reinstall and lockwire the filler plug. Use lockwire (C206).

(6) If added fluid disappears from bull's-eye, add fluid to bring the level to the bull's-eye midpoint. Bleed the shock absorber. (Refer to para 5-120.)

1-11. Hydraulic System Servicing. Use fire-resistant hydraulic fluid MIL-H-83282 (C177), (if installed) to service the utility and flight control hydraulic systems. Its higher flash point provides a greater margin of safety than hydraulic fluid MIL-H-5606 (C175). The two fluids are fully compatible. However, the presence of more than 3 percent MIL-H-5606 will reduce the fire resistance of MIL-H-83282 proportionately.

a. The viscosity of MIL-H-83282 increases as temperature decreases. Because of this, it should not be used below -50°F (-46°C). If temperature drops below this limit, control motions may become stiff and sluggish. If this happens, cycle the controls to agitate the fluid. This, along with radiant heat from engines and transmissions, may warm the fluid enough to permit satisfactory operation.

b. If the controls remain sluggish after cycling and warming, drain the system and service with MIL-H-5606.

1-12. Utility Hydraulic System Tank (Preferred Method). Service the utility hydraulic system as follows:

CAUTION

If any hydraulic fluid is lost from the utility hydraulic system during component replacement or routine maintenance, the fluid must be replaced, tank level checked, and pumps and systems primed. (Refer to para 7-11.) Damage to systems components will result if the system is operated with insufficient fluid.

a. (See fig. 1-3.) Make sure the manual control valve handle is at NORMAL.

NOTE

The test stand system pressure hose may be equipped with coupling nut 3205-8 or 3305-8 and the system return hose with coupling nut 3205-12 or 3305-12 (Aeroquip Corp) or equivalent. The 3205 series are for flare type fittings and 3305 are for flareless type fittings.

b. (See fig. 1-38.) Connect the pressure line from hydraulic teststand D5-A or equivalent to the utility system pressure external hydraulic connection.

c. (See fig. 1-1.) Apply pressure at 1,500 to 2,000 psi from the teststand. Request that an assistant cycle the cargo loading ramp and monitor the pressurized tank indicating rod during filling.

CAUTION

Do not cycle door with ramp in the full up position. Damage to door and fuselage will occur.

d. When the assistant reports the system full, immediately stop cycling the ramp and shut down the teststand.

NOTE

The system is full when, with the cargo loading ramp fully up or down, the tank indicating rod shows FULL/RAMP UP or FULL/RAMP DOWN, as applicable.

e. Disconnect the teststand from the helicopter.

1-13. Utility Hydraulic System Tank (Alternate Method). (See fig. 1-1 and 1-3.)

NOTE

To properly service the utility hydraulic tank, the cargo loading ramp shall be full up or full down.

CAUTION

Do not select the manual control valve FILLING position when the engine or the apu is running. Damage to components could result.

a. Turn the manual control valve handle to FILLING. This relieves utility system pressure.

b. Read the indicating rod on the hydraulic tank.

c. Fill the filler assembly with hydraulic fluid (C175 or C177).

CAUTION

The hand pump can be damaged by careless operation. Do not slam the handle against the upper and lower stops. When two men operate the handle, do not overstress the pump by seeing how fast you can pump up pressure. Careless operation can result in broken mounting lugs, broken fulcrum support lugs, and cracked handle supports.

d. If the cargo loading ramp is up, operate the hydraulic hand pump until tank indicating rod shows FULL/RAMP UP. If the cargo loading ramp is down, operate hydraulic hand pump until the tank indicating rod shows FULL/RAMP DOWN.

NOTE

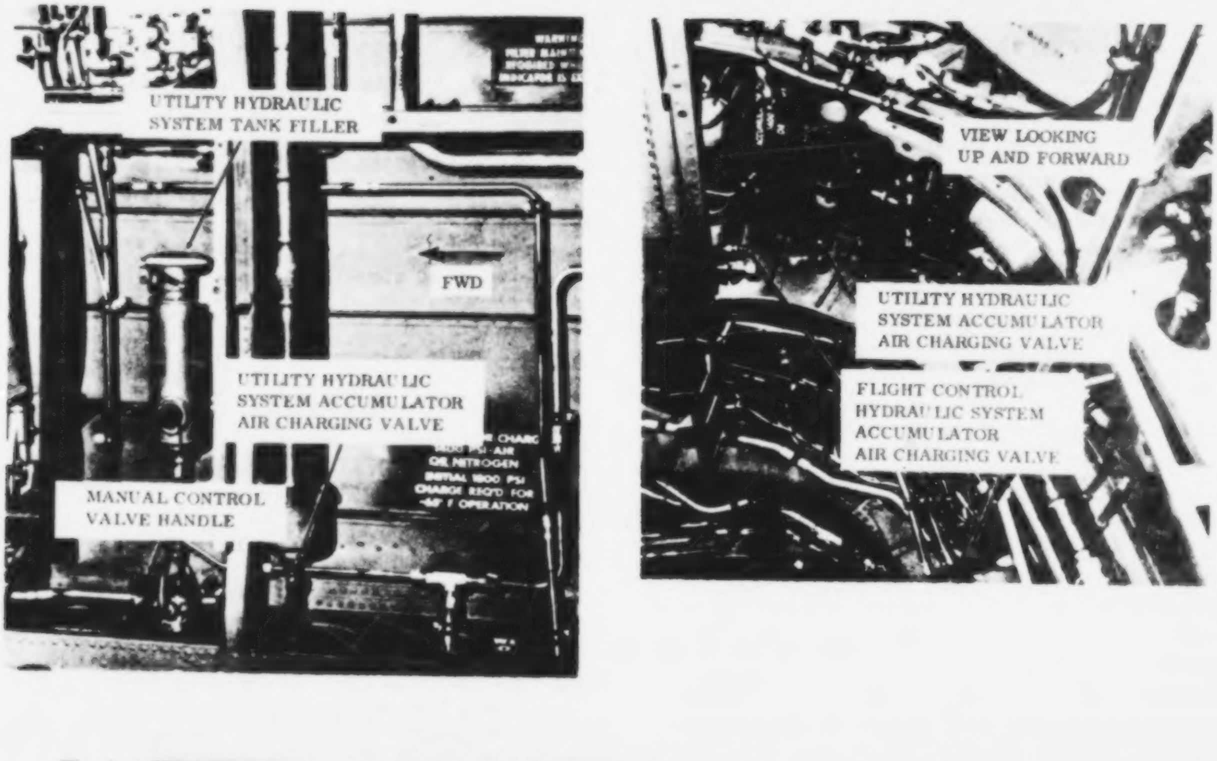
Do not allow fluid level to fall below the level of sight glass on filler assembly while the manual control valve is at FILLING. If it does, air will enter the hydraulic system.

e. Turn the manual control valve handle to NORMAL.

1-14. Flight Control Hydraulic System Tank (Preferred Method). Service either tank of the flight control hydraulic system as follows:

CAUTION

If any hydraulic fluid is lost from the flight control hydraulic system during component replacement or routine maintenance, the fluid must be replaced, tank level checked, and the pumps and system primed. (Refer to para 7-11.) Damage to system components will result if the system is operated on insufficient fluid.


UTILITY HYDRAULIC SYSTEM TANK FILLER
FWD
UTILITY HYDRAULIC SYSTEM ACCUMULATOR AIR CHARGING VALVE
CHARG
1400 PSI-AIR
OR NITROGEN
INITIAL 1800 PSI
CHARGE REQ'D FOR
-65° F OPERATION
MANUAL CONTROL VALVE HANDLE
VIEW LOOKING UP AND FORWARD
UTILITY HYDRAULIC SYSTEM ACCUMULATOR AIR CHARGING VALVE
FLIGHT CONTROL HYDRAULIC SYSTEM ACCUMULATOR AIR CHARGING VALVE
FLIGHT CONTROL HYDRAULIC SYSTEM TANK FILLER
FWD

8114-695-20

Figure 1-3. Hydraulic System Servicing

a. (See fig. 1-1.) Open the applicable aft pylon work platform for access to the tank.

WARNING

If the WATER DRAIN button is not pressed (step b., below), personnel injury could occur when the tank cap is removed.

b. On 69-17125 and subq and helicopters with MWO 55-1500-210-30/30, press the WATER DRAIN button on the air pressure regulator valve. This relieves pneumatic pressure on the flight control hydraulic return system. The valve is in the right side of the aft pylon.

NOTE

The teststand system pressure hose may be equipped with coupling nut 3205-8 or 3305-8 and the system return hose with coupling nut 3205-12 or 3305-12 (Aeroquip Corp) or equivalent. The 3205 series are for flare type fittings and 3305 are for flareless type fittings.

c. (See fig. 1-38.) Connect the pressure line from hydraulic teststand D5-A, or equivalent, to the appropriate PRESSURE external hydraulic connection.

d. (See fig. 1-3.) Remove the filler cap from the tank being serviced.

e. Request that an assistant monitor fluid level in the tank sight glass.

f. Apply pressure at 1,500 to 2,000 psi from the teststand. Request that an assistant cycle the flight controls during filling.

NOTE

The more rapidly controls are cycled, the more rapidly the system will be filled.

g. When the monitor assistant reports system near full, shut down the teststand. Waiting until the system is full may result in overfilling.

WARNING

The tank filler cap is not properly installed until the cap release pins are extended.

h. Install the hydraulic tank filler cap. Disconnect the teststand from the helicopter.

1-15. Flight Control Hydraulic System Tank (Alternate Method). (See fig. 1-1 and 1.3.) Service either tank of the flight control hydraulic system as follows:

CAUTION

If any hydraulic fluid is lost from flight control hydraulic system during component replacement or routine maintenance, this fluid shall be replaced, tank level checked, pumps and the system primed. (Refer to para 7-11.) Damage to system components will result if the system is operated with insufficient fluid.

a. Make sure the thrust control is at full DOWN position.

NOTE

The thrust control shall be full DOWN so that an accurate fluid level can be indicated on the tank gage.

b. Open the applicable aft plyon work platform.

WARNING

If the WATER DRAIN button is not pressed (step c., below), personnel injury could occur when cap is removed.

c. On 69-17125 and subq and helicopters with MWO 55-1500-210-30/30, press WATER DRAIN button on air pressure regulator valve. This relieves pneumatic pressure on the flight control hydraulic return system. The valve is in the right side of aft pylon.

WARNING

The cap is not properly installed until the cap release pins are extended.

d. Remove filler cap from tank. Fill tank with hydraulic fluid (C175 or C177) to FULL level. Install the filler cap.

e. Close the work platform.

1-16. Utility Hydraulic System Accumulator. (See fig. 1-1 and 1-3.) There are two accumulators in the utility hydraulic system. One has a 200-cubic inch capacity. The **other has a 25-cubic inch capacity. Charge either accumulator in the utility hydraulic system as follows:**

a. Turn the manual control valve handle to FILLING. This relieves utility hydraulic system pressure.

WARNING

The high pressure air valve does not contain a valve core. Consequently, if valve leaks internally, air will be trapped between cap and metal-to-metal seal of valve. Allow this trapped air to escape by loosening the cap about one to two turns before removing cap.

b. Remove the cap from the high pressure air valve. Attach an air filling chuck to the valve stem.

c. While holding the valve body with a wrench, turn the upper hex nut counterclockwise one to two turns so that the valve is opened.

d. Charge the accumulator with air or nitrogen to the pressure indicated by the chart in fig. 1-4.

NOTE

Check the accumulator after 1 hour to make sure pressure has stabilized within 100 psi less than initial charge pressure.

e. **TORQUE THE UPPER HEX NUT TO 50 TO 70 POUND-INCHES.**

f. Remove the air filling chuck. Install the valve cap.

g. Turn the manual control valve handle to NORMAL.

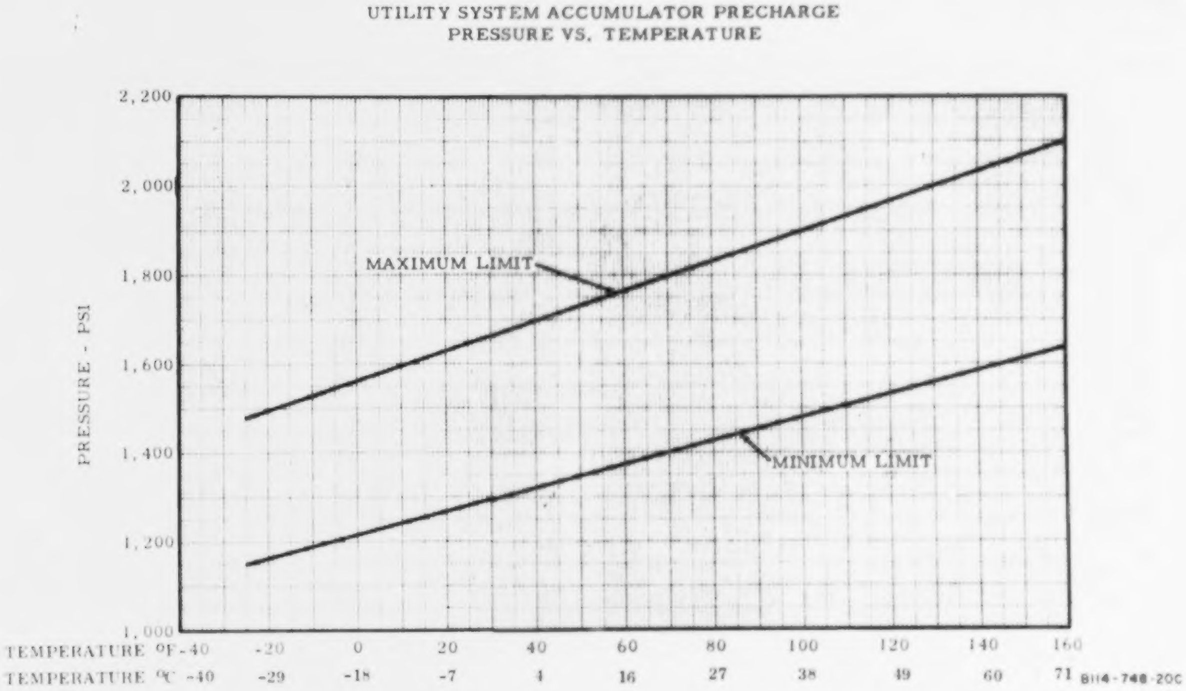


Figure 1-4. Utility Hydraulic System Accumulator Precharge Pressure Limits Chart

1-17. Flight Control Hydraulic System Accumulator. (See fig. 1-1 and 1-3.) Charge either accumulator in the flight control system as follows:

a. Relieve hydraulic pressure in the flight control hydraulic system accumulator by jiggling the pitch and roll control stick.

b. Charge the accumulator. Refer to para 1-16, steps b. thru f., except charge to the pressure indicated by the chart in fig. 1-5.

1-18. Landing Gear Shock Strut (Fluid). (See fig. 1-1 and 1-6.) Service forward or aft shock struts simultaneously to

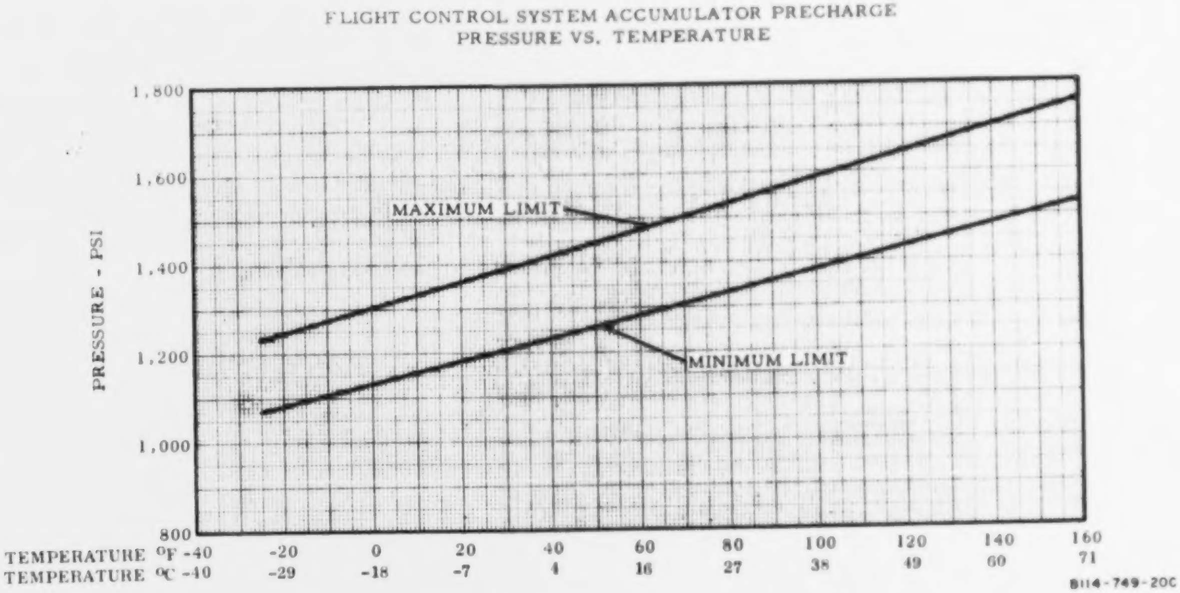


Figure 1-5. Flight Control Hydraulic System Accumulator Precharge Pressure Limits Chart

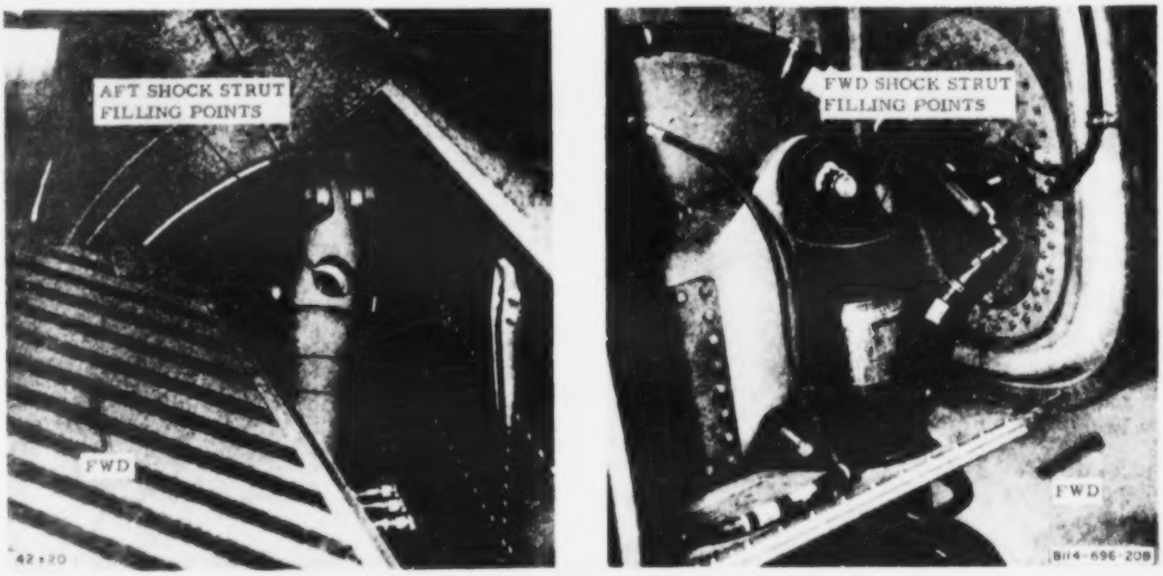

AFT SHOCK STRUT FILLING POINTS
FWD
FWD SHOCK STRUT FILLING POINTS
FWD
B114-696-208

Figure 1-6. Landing Gear Shock Strut Fluid Servicing

ensure complete deflation of struts during servicing. Service forward or aft shock struts as follows:

WARNING

The high pressure air valve does not contain a valve core. Consequently, if valve leaks internally, air will be trapped between cap and metal-to-metal seal of valve. Allow this trapped air to escape by loosening cap about one or two turns before removing cap.

a. Remove the cap from the high pressure air valve at the lower end of both struts.

CAUTION

It is possible to overfill shock struts with hydraulic fluid if struts are not fully collapsed. Shock struts shall be fully collapsed before adding hydraulic fluid.

b. Hold the valve body of both struts with a wrench and turn the upper hex nut counterclockwise one-half to one and one-half turns. Allow air pressure in both struts to be completely discharged. Rock the helicopter by hand from side to side as air pressure discharges. This ensures complete deflation of the struts.

c. Remove the lockwire and air valve from both struts.

WARNING

If shock struts were improperly serviced previously, it is possible for hydraulic fluid to be under pressure. Loosen filler plugs slowly to allow pressurized fluid to escape safely. Otherwise, personal injury could result.

d. Remove lockwire and one filler plug from the upper end of both struts.

e. Charge both struts to 50 psi pressure with hydraulic fluid (C175) to bottom the floating piston. Loosen the other filler plug to bleed air from the strut. Bleed strut until a steady stream of fluid flows from plug. Release hydraulic pressure.

NOTE

If forward (lower) filler plug on aft landing gear strut is loosened or removed, hydraulic fluid will be lost from strut. Therefore, servicing and bleeding of aft struts will be accomplished thru aft (upper) filler port.

f. Install the filler plug. **TORQUE BOTH FILLER PLUGS TO 200 TO 300 POUND-INCHES**. Lockwire the plugs. Use lockwire (C206).

g. Install the high pressure air valve. Use a new preformed packing. **TORQUE THE VALVE TO 100 TO 130 POUND-INCHES**. Secure it with lockwire (C206).

h. Service both struts with air. (Refer to para 1-19.)

1-19. Landing Gear Shock Strut (Air). (See fig. 1-1, 1-7, and 1-8.) Service both forward or both aft struts simultaneously with air as follows:

CAUTION

When servicing the aft landing gear struts, ensure that the ramp is in a higher than level position or is fully closed.

NOTE

The aircraft should be rocked when inflating shock struts. (Refer to TM 55-409.)

a. Provide a source of high pressure air (minimum 3,000 psi). The source must have a suitable attached pressure gage (0 to 3,000 psi) and a pressure regulator.

WARNING

The high pressure air valve does not contain a valve core. Consequently, if a valve leaks internally, air will be trapped between cap and metal-to-metal seal of valve. Allow this trapped air to escape by loosening the cap about one to two turns before removing the cap.

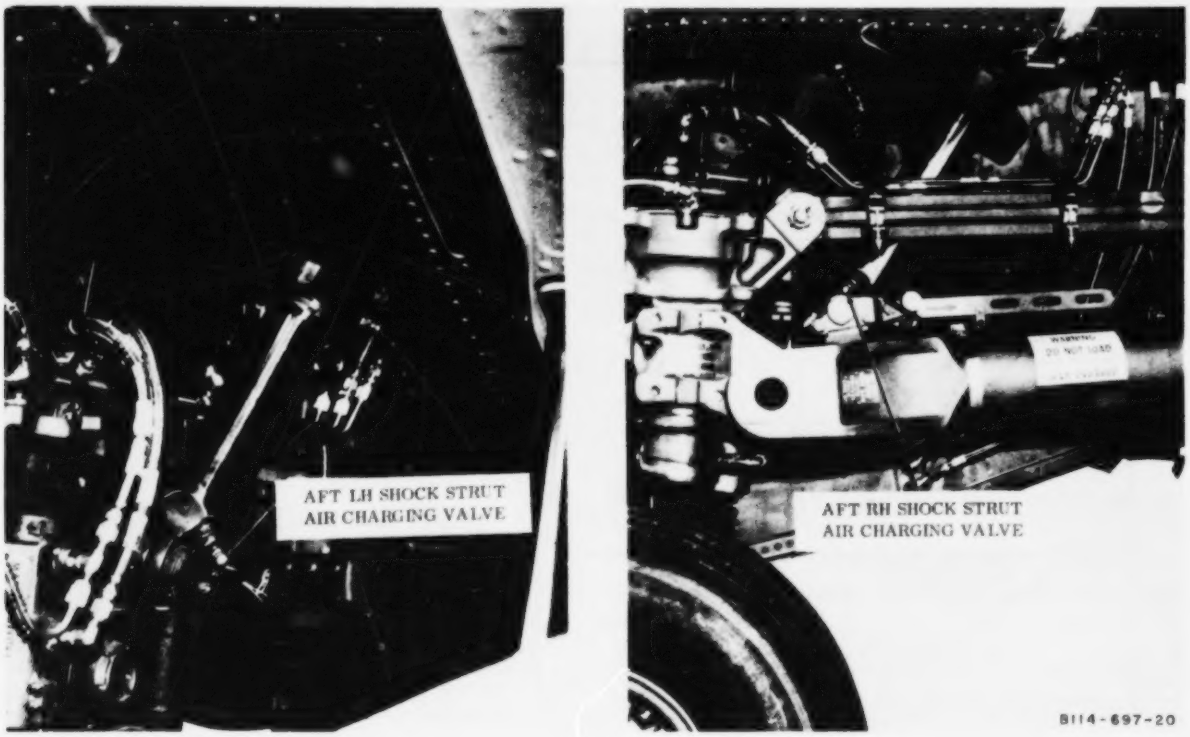


Figure 1-7. Aft Landing Gear Shock Strut Air Servicing

b. Remove the cap from the high pressure air valve at the lower end of the shock strut. Attach an air chuck to the valve stem.

c. While holding the valve body with a wrench, turn the upper hex nut counterclockwise one or two turns to open the valve.

d. (See the illustration in table 1-2.) Measure strut extension as follows:

(1) Measure forward landing gear strut extension from the bottom of the nut on the bottom of the barrel assembly to the end of the finished surface of the piston.

(2) Measure aft landing gear strut extension from the bottom of the nut on the bottom of the barrel assembly to the centerline of the fulcrum pin.

e. Determine strut extension as follows:

CAUTION

Make sure forward or aft shock struts are serviced as a pair. To achieve an accurate pressure reading at ½-inch shock strut extension, the opposite strut must also be at ½-inch. An overextended strut on one side will reduce the pressure reading on the opposite strut. Improper servicing could cause ground resonance.

(1) Inflate or deflate both forward or both aft shock struts until each strut is extended ½-inch. (See table 1-2, DIMENSION A.) This ensures that the struts are not bottomed.

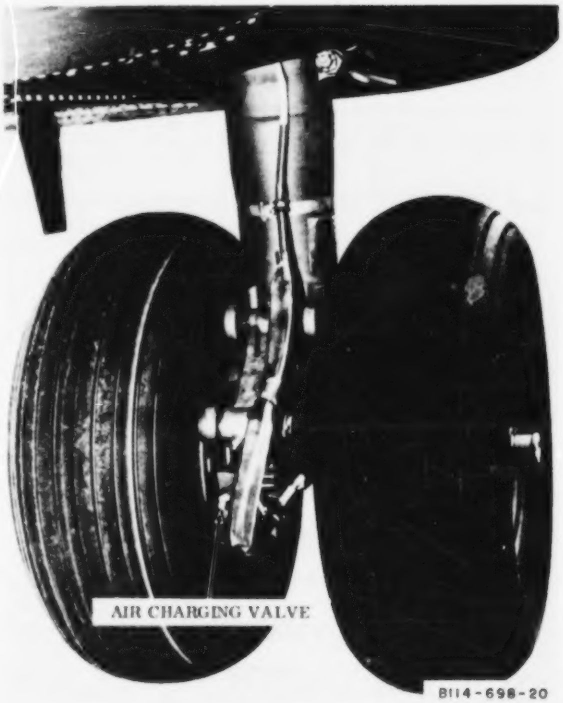
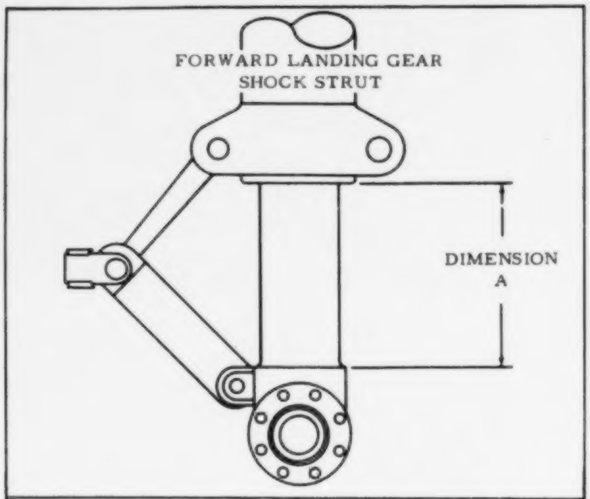
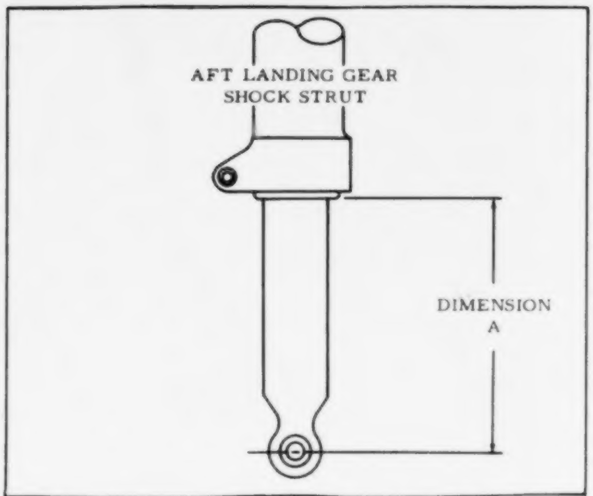


Figure 1-8. Forward Landing Gear Shock Strut Air Servicing

Table 1-2. Landing Gear Shock Strut Servicing


FORWARD LANDING GEAR
SHOCK STRUT
DIMENSION
A

AIR PRESSURE (PSIG)	DIMENSION A INCHES
2,305 - 2,355	1/2
1,763 - 1,813	1
1,425 - 1,475	1-1/2
1.196 - 1,245	2
1,025 - 1,075	2-1/2
897 - 947	3
789 - 848	3-1/2
685 - 735	4
625 - 675	4-1/2
595 - 645	5
540 - 590	5-1/2
511 - 561	6
575 - 525	6-1/2
450 - 500	7
415 - 465	7-1/2
385 - 435	8
365 - 415	8-1/2
350 - 400	9
335 - 385	9-1/2
315 - 365	10
300 - 350	10-1/2
274 - 324	


AFT LANDING GEAR
SHOCK STRUT
DIMENSION
A

AIR PRESSURE (PSIG)	DIMENSION A INCHES
1,725 - 1,800	5
1,548 - 1,598	5-1/2
1,405 - 1,455	6
1,285 - 1,335	6-1/2
1,183 - 1,233	7
1,096 - 1,146	7-1/2
1,020 - 1,070	8
954 - 1,004	8-1/2
896 - 946	9
844 - 894	9-1/2
805 - 855	10
775 - 825	10-1/2
735 - 785	11
700 - 750	11-1/2
645 - 685	12 (FULLY EXTENDED)

42x54

PAGES 1-14.1 AND 1-14.2 DELETED

NOTE

To achieve an accurate pressure reading at 1/2 inch shock strut extension, the opposite strut must be deflated or extended to 1/2 inch. An extended shock strut must be deflated or extended shock strut on one side will reduce the pressure on the shock strut being measured at 1/2 inch (service forward or aft shock struts simultaneously).

1-20. Tires. Refer to table 1-3 for tire servicing information. Tire pressure must be compatible with shock absorber type.

WARNING

Remote Inflation Safety Chuck Gage AS1675 (30003) or equivalent shall be used when inflating tires to 50 psi and above.

a. When a tire and wheel assembly shows a repeated pressure loss exceeding 5% of the correct operating inflation pressure in a 24 hour period, it shall be removed from the aircraft and repaired/replaced.

b. Temperature changes affect tire pressure; a change of $5^{O}F$ produces approximately a 1% respective change in pressure. Therefore, all pressure measurements must be made on cool tires (i.e., those at equilibrium with ambient temperatures).

Table 1-3. Tire Pressure

TYPE OF BLADE SHOCK ABSORBER	HELICOPTER GROSS WT. (LB)	FWD TIRE PRESS. (PSI)	AFT TIRE PRESS. (PSI)
CH-47B 114H5900 series on[1] either or both heads	To 33,000	67	67
	33,000 To 40,000	140	77
114H6800 series on both heads[1]	All	88	88
CH-47C 114H6800[1]	All	88	88

[1] All shock absorbers on one head must be the same.

1-21. Cargo Hook Actuator. (See fig. 1-1 and 1-9.) Charge the cargo hook actuator with compressed air as follows:

WARNING

The high pressure air valve does not contain a valve core. Consequently, if a valve leaks internally, air will be trapped between cap and metal-to-metal seal of valve. Allow trapped air to escape by loosening cap about one to two turns before removing the cap.

a. Remove the cap from the high pressure air valve. Attach an air filling chuck to the valve stem.

b. While holding the valve body with a wrench, turn the upper hex nut counterclockwise one to two turns so that the valve is opened.

c. Charge the unit to 2,100 psi, regardless of temperature.

NOTE

The actuator must be serviced to 2,100 psi minimum. Otherwise, it will not work right.

d. **TORQUE THE UPPER HEX NUT TO 50 TO 70 POUND-INCHES.**

e. Remove the air filling chuck and install the valve cap.

1-22. Hoist Cable Cutter. Service the cable cutter after firing as follows:

WARNING

Make sure that all electrical power is OFF before servicing the hoist cable cutter. Disconnect the battery plug.

a. If the cable cutter has been accidentally fired without a cable in place, remove and inspect the cable cutter assembly.

b. Remove the lockwire and electrical connection.

c. Remove the adapter and lockwasher.

d. Insert a short drift SK15241-16 into the center hole in the bottom of the cutter body. Tap the drift to release the cable cutting punch.

e. Remove the short drift from the hole. Insert long drift SK15241-15 into hole. Drive cutting punch and expended cartridge out of the chamber.

CAUTION

To prevent damage to cutter, make sure that all parts of cut cable are removed when cutter is cleaned.

f. Clean the cartridge chamber with powder solvent (C256). Use a bristle brush. Wipe cutter with a soft cloth.

WARNING

Do not install a cartridge if the cable cutter is to be stowed. Install a cartridge in the cable cutter only when the cutter becomes operational.

g. Insert a new cartridge into the chamber. Cable cutters 114E6052-1 use cartridge TA-97155. Cable cutters 114E6052-3 and 114E6052-5 use cartridge TA-96713.

h. Install the lockwasher and adapter.

WARNING

To prevent accidental firing of the cartridge, do not use any multimeter other than the one specified in step i.

i. Check continuity thru the pin, cartridge, and cutter body to ground. Use multimeter AN/URM-105. The resistance from pin to ground shall be 3 to 6.5 ohms.

j. Reconnect and lockwire the electrical connection.

1-23. Lower Rescue Door Actuator Gearbox. (See fig. 1-1 and 1-9.) The gearbox is located at sta 358 between the rescue hatch doors.

a. Service gearbox 114S2623-6 thru the filler plug to the center of the sight glass at the left side of the gearbox housing on the beveled shoulder. Use oil (C228). Gearbox 114G1623-3 and 114G1623-8 cannot be serviced.

b. Install the filler plug.

(2) Measure and record the pressure for both struts on the gage. Note the lower of the two pressures.

NOTE

A large difference in the two pressure readings could indicate binding caused by internal damage.

(3) Locate the pressure reading on the chart in table 1-2. Note the extension under DIMENSION A next to the pressure reading.

NOTE

Rocking the helicopter while applying pressure ensures proper pressure readings.

f. Inflate both struts in turn to the extension noted in step (3). Rock the helicopter from side to side while applying pressure. Again check the extension of the first strut serviced. Raise or lower the strut as required to match the opposite strut and DIMENSION A requirements.

NOTE

If extension and pressure values in table 1-2 cannot be attained, check the shock strut for proper fluid servicing. (Refer to para 1-18.)

g. TORQUE THE UPPER HEX NUT TO 50 TO 70 POUND-INCHES.

h. Remove the air filling chuck. Install the valve cap.

1-20. Tires. Refer to table 1-3 for tire servicing information. Tire pressure must be compatible with shock absorber type.

WARNING

Remote Inflation Safety Chuck Gage AS1675 (30003) or equivalent shall be used when inflating tires to 50 psi and above.

a. When a tire and wheel assembly shows a repeated pressure loss exceeding 5 percent of the correct operating inflation pressure in a 24 hour period, it shall be removed from the aircraft and repaired or replaced.

b. Temperature changes affect tire pressure; a change of 5°F produces approximately a 1 percent respective change in pressure. Therefore, all pressure measurements must be made on cool tires (i.e., those at ambient temperature).

1-21. Cargo Hook Actuator. (See fig. 1-1 and 1-9.) Charge the cargo hook actuator with compressed air as follows:

WARNING

The high pressure air valve does not contain a valve core. Consequently, if a valve leaks internally, air will be trapped between cap and metal-to-metal seal of valve. Allow trapped air to escape by loosening cap about one to two turns before removing the cap.

Table 1-3. Tire Pressure

TYPE OF BLADE SHOCK ABSORBER	HELICOPTER GROSS WT. (LB)	FWD TIRE PRESS. (PSI)	AFT TIRE PRESS. (PSI)
CH-47B 114H5900 series on[1] either or both heads	To 33,000	67	67
	33,000 To 40,000	140	77
114H6800 series on both heads[1]	All	88	88
CH-47C 114H6800[1]	All	88	88

[1] All shock absorbers on one head must be the same.

a. Remove the cap from the high pressure air valve. Attach an air filling chuck to the valve stem.

b. While holding the valve body with a wrench, turn the upper hex nut counterclockwise one to two turns so that the valve is opened.

c. Charge the unit to 2,100 psi, regardless of temperature.

NOTE

The actuator must be serviced to 2,100 psi minimum. Otherwise, it will not work right.

d. TORQUE THE UPPER HEX NUT TO 50 TO 70 POUND-INCHES.

e. Remove the air filling chuck and install the valve cap.

1-22. Hoist Cable Cutter. Service the cable cutter after firing as follows:

WARNING

Make sure that all electrical power is OFF before servicing the hoist cable cutter. Disconnect the battery plug.

a. If the cable cutter has been accidentally fired without a cable in place, remove and inspect the cable cutter assembly.

b. Remove the lockwire and electrical connection.

c. Remove the adapter and lockwasher.

d. Insert a short drift SK15241-16 into the center hole in the bottom of the cutter body. Tap the drift to release the cable cutting punch.

e. Remove the short drift from the hole. Insert long drift SK15241-15 into hole. Drive cutting punch and expended cartridge out of the chamber.

CAUTION

To prevent damage to cutter, make sure that all parts of cut cable are removed when cutter is cleaned.

f. Clean the cartridge chamber with powder solvent (C256). Use a bristle brush. Wipe cutter with a soft cloth.

WARNING

Do not install a cartridge if the cable cutter is to be stowed. Place serviceable cartridge in a protective container tagged with helicopter serial number and cartridge installation date for ready reference.

g. Insert a new cartridge into the chamber. Cable cutters 114E6052-1 use cartridge TA-97155. Cable cutters 114E6052-3 and 114E6052-5 use cartridge TA-96713.

h. Enter the following in DA Form 2408-18: cartridge lot number, installed date, and required removal date.

i. Install the lockwasher and adapter.

WARNING

To prevent accidental firing or damage to the cartridge do not attempt to perform a continuity test of the cartridge.

j. Reconnect and lockwire the electrical connection.

1-23. Lower Rescue Door Actuator Gearbox. (See fig. 1-1 and 1-9.) The gearbox is located at sta 358 between the rescue hatch doors.

a. Service gearbox 114S2623-6 thru the filler plug to the center of the sight glass at the left side of the gearbox housing on the beveled shoulder. Use oil (C228). Gearbox 114G1623-3 and 114G1623-8 cannot be serviced.

b. Install the filler plug.

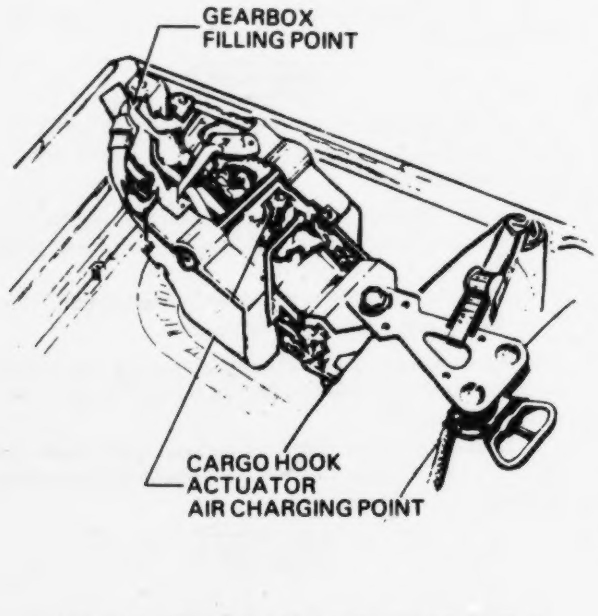


Figure 1-9. Rescue Hatch Lower Door and Cargo Hook Actuating Cylinder Servicing Points

1-24. Oil Change Schedule. The oil change intervals for those components requiring such changes are in fig. 1-11. There is no scheduled change interval for helicopter transmissions.

1-25. General Cleaning.

Cleaning information for the helicopter is contained in TM 55-1500-333-24. Additional information and procedures are in paragraphs 1-26 thru 1-32.

NOTE

Cleaning the aircraft before preparation for storage or shipment is particularly important. Even when a preservative compound coating is applied, residue from exhaust gases or contamination of any kind accelerates corrosion. Interior cleaning prevents debris from entering operating mechanisms.

CAUTION

Do not use steam or high pressure water to clean the assembled aircraft• or remove honeycomb panels.

1-26. Fuselage Exterior. Clean the fuselage exterior as follows:

CAUTION

Use protective covers as required. Do not allow solvents or water to enter the engine and open apu inlet or exhaust. Also, prevent water from entering the heater inlet and exhaust, and the pitot and static openings. Use protective covering on landing gear switches and electrical connectors.

a. Use protective covers as required. (See fig. 1-31.)

b. Protect lubricated parts such as exposed shafts of shock struts, shock absorbers and landing gear oleos from cleaning solution.

c. Open drain plugs to drain water.

d. Prepare a mixture of one part cleaning compound (C100) in three to seven parts water. Use stronger mixtures for exhaust outlet areas and very dirty surfaces.

CAUTION

Cleaning solution splashed on plexiglass must be rinsed with clear water before it dries. Otherwise, the plexiglass may become hazy.

e. Apply cleaning solution in liberal quantities to one small section at a time.

f. Allow solution to remain on surface for 5 to 10 minutes. Scrub with a soft bristle brush to remove heavy soil.

CAUTION

If solution is allowed to dry or is not completely rinsed off, it could damage painted surfaces.

g. Rinse surface clean with a stream of water. Water heated to 120° to 140°F gives best results.

CAUTION

Do not allow water to enter synchronizing shafts. If this happens, high frequency vibration during flight will result. If water enters the shafts, refer to para 6-4 or 6-5 for removal instructions.

h. Repeat steps e. and f., as necessary, to produce a clean surface.

i. On preserved helicopters, clean exterior surfaces as necessary.

j. Inspect lubricated areas after cleaning. Lubricate components as necessary. (Refer to Section II Lubrication.)

1-27. Deleted.

1-28. Deleted.

1-29. Exposed Hydraulic Pistons. Clean exposed surfaces of shock strut and hydraulic actuator pistons as follows:

CAUTION

Hard rubbing causes grit to scratch metal surfaces.

a. Protect tires from fluid, using suitable covers.

b. Clean pistons with clean cloths (C104) dipped in hydraulic preservative fluid (C176) or hydraulic fluid (C175 or C177). Be careful not to damage highly finished surfaces or seals.

c. Flush away dirt. Do not rub it off. Change cloths frequently.

d. If hydraulic fluid (C175 or C177) was used, apply a coat of hydraulic preservative fluid (C176) after cleaning to prevent corrosion.

1-30. Deleted.

1-31. Rotary-Wing Blades. To remove light soil accumulation, wipe rotary-wing blades frequently with a soft, clean cloth (C108). Wash blades as necessary to remove heavy soil accumulation. It is not necessary to wax them. To wash blades, proceed as follows:

CAUTION

Be careful when cleaning the ISIS indicator on the rotor blades. Do not use a dry cloth. Do not use strong detergent soaps. They contain alkaline compounds that damage plastics. Do not use benzene, toluene, acetone, methyl-ethyl-ketone, ethyl acetate or lacquer thinner. These items will damage plastic parts.

a. Rinse the blades with clean water to remove any loose dirt.

b. Wash the blades with a mild soap (C312) and water solution. Use a soft, clean cloth (C108).

c. Rinse the blades thoroughly with clean water.

d. Repeat steps b. and c. until the blades are clean.

1-32. Cleaning After Salt Water Landing or Immersion. If the helicopter has been exposed to salt water, clean it as follows:

a. Rinse all areas of helicopter that have been submerged or subjected to salt spray. Use fresh water. Allow them to dry.

b. Open all drain valves. Flush bilge areas and area below the cargo loading ramp flooring with fresh water.

c. Allow all areas to drain completely and to dry before closing drain valves.

d. Coat all unpainted metal parts and moving parts with a mixture of 75 percent lubricating oil (C224) and 25 percent, corrosion-preventive compound (C123).

e. If the helicopter will continue to operate in a salt water environment, coat all exterior fuselage surfaces which require maximum protection with exterior surface corrosion-preventive compound (C124).

CAUTION

Do not allow hydraulic fluid (C177) to contact parts that are subject to high temperatures. A fire hazard will be created. Avoid using any hydraulic fluid near wires, seals, and rubber parts. It may have a deteriorating effect on them.

f. Wipe exposed or extended landing gear shock strut pistons with hydraulic fluid (C175 or C177).

g. Check to see if the two holes in the outboard half of each wheel are sealed. If they are not sealed, do the following:

(1) Remove the wheels and bearings. Refer to para 3-18 or 3-51.

(2) Clean and dry the bearings. Inspect them for water damage.

(3) Pack the bearings with grease (C164).

(4) Install the wheel assemblies. (Refer to para 3-24 or 3-57.)

h. Purge all landing gear fittings with grease (C167).

i. Inspect landing gear and adjacent area for loss of paint. Retouch with applicable primer and lacquer immediately after cleaning and rinsing. (Refer to TB 746-93-2.)

j. Rinse exterior of magnesium ramp hinge fittings with fresh water.

1-33. Deleted.

1-34. Materials Cleaning (AVIM).

Subsequent text provides specific cleaning information for all materials used in the construction of the helicopter. Refer to table 1-4. When recommended solutions or compounds are not readily available, an abbreviated cleaning procedure, using approved materials, can be used at the Maintenance Officer's discretion. However, the recommended cleaning procedures should be used as soon as the materials are available.

WARNING

When the following cleaning procedures are being complied with observe the applicable precautions in the WARNING page.

1-35. Cleaning of Metal Parts (AVIM). Clean metal parts with a vapor degreaser. Trichloroethylene (C366) or perchlorethylene (C242) is used as the degreasing solvent. Follow these general procedures when cleaning parts in a vapor degreaser.

WARNING

Perchlorethylene and trichloroethylene are toxic and highly flammable. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

a. Lower parts slowly into the vapor area.

b. Suspend parts from hooks, racks, or in baskets, so that condensed liquid can drain. When vapor stops condensing on parts, they are ready for removal.

c. Remove parts slowly from the vapor area. If foreign matter remains on parts, hold them briefly above vapor to allow cooling. After parts have been cooled, return them to vapor. Repeat until all foreign matter is removed.

1-36. Removal of Welding Flux (AVIM). Remove welding flux as follows:

a. Scrub part of area, using a brush and hot water.

WARNING

Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Avoid contact with the skin. Wear protective clothing. Wash thoroughly after using.

b. Prepare a solution of 12 percent nitric acid (C11), ¼ to ½ percent hydrofluoric acid (C178), and 87½ to 87¾ percent water. All percentages are by volume.

c. After scrubbing, dip the part into the solution for 5 minutes.

d. Rinse the cleaned area with cold water for at least 10 minutes to remove acid solution. Allow parts to dry thoroughly.

1-37. Removal of Soldering Flux (AVIM). Remove soldering flux as follows:

a. Scrub or wipe the soldered area, using a brush or cloth (C104) and a 5 percent solution of soda (C315) to neutralize acid in the flux.

b. Rinse the neutralized area with cold water to remove soda solution.

Table 1-4. Cleaning and Treating Corroded Parts

METAL	FORM	CLEANING	TREATMENT
Aluminum unfinished surfaces only	Mild surface pitting, staining, and superficial etching	Apply cleaning compound (C101) and heavy duty brightener	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum	Heavy surface pitting	Hand rub with aluminum wool (C57) and kerosene (C185). Apply cleaning compound (C101) and rinse with fresh water	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum Alclad unfinished surfaces	Mild or heavy surface pitting, staining, and superficial etching	Apply cleaning compound (C101) and rinse with fresh water. Do not use abrasives	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum	Intergranular corrosion	Remove corroded areas with routing tools. Burnish parts to remove all sharp edges	Treat immediately with a 5 percent solution of potassium dichromate (C254) and allow to dry. Brush off excess crystals. Spray a uniform coat of primer (C259) on the area. Spray two coats of primer if there are no provisions for drainage
Aluminum	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Magnesium	Surface pitting	Small parts (Refer to para 1-38.)	(Refer to para 1-38.)
Magnesium	Surface pitting	Large, nonremovable parts — remove corrosion products with a stiff bristle brush	Apply a type I chrome-pickle solution in accordance with MIL-M-3171 for 1 minute and wash with fresh water
Magnesium	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Steel	Severely rusted	Replace parts	Not applicable
Steel	Lightly rusted parts (No deep pitting)	Use steel wool (C327) to remove rust and clean as necessary	Apply one coat of primer (C259) on previously cadmium-plated parts. Apply two coats of aluminum pigmented lacquer or finish to match. Cadmium-plate removable parts in accordance with QQ-P-416

1-38. Cleaning and Treating of Magnesium Alloy Parts (AVIM). Handle magnesium parts as follows:

a. Galvanic anodize parts containing Dowmetal M, EK30A, and EK41A magnesium alloys in accordance with MIL-M-3171, type IV.

b. Anodize parts made from ZK60 magnesium alloy in accordance with MIL-M-45202, type I. When this treatment is used, do not allow anodic coating to build up excessively.

c. Clean and treat all parts not noted in steps a. and b. as directed in subsequent steps.

WARNING

Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Avoid contact with the skin. Wear protective clothing. Wash thoroughly after using.

WARNING

Trichloroethylene is toxic and highly flammable. Work in a well ventilated area away from open flame. Avoid inhaling fumes and prolonged contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

(1) Prepare each of the cleaning and treating solutions as follows:

(a) Mix 6 to 10 ounces of alkaline cleaner (C100) to water, in a steel container, to make 1 gallon of alkaline cleaning solution.

(b) Mix 10 to 20 percent, by weight, of chromic acid (C97) to water, in a lead-line or 2S aluminum container, to make a chromic acid solution.

(c) Mix 15 to 25 percent, by weight, of hydrofluoric acid (C179) to water, in a lead- or rubber-lined container, to make a hydrofluoric acid solution.

(d) Mix 4 to 6 percent, by weight, of sodium acid fluoride (C314) to water, in a lead- or rubber-lined container, to make a sodium acid fluoride solution.

(e) Mix 10 to 20 percent, by weight, of sodium dichromate (C316) and 0.1 to 0.25 percent by weight of calcium fluoride (C77) to water, in a steel container, to make a dichromate solution.

(2) Clean and treat parts as follows:

(a) Clean parts by suspending them in a vapor degreaser, using trichloroethylene (C366) as the solvent. (Refer to para 1-35.)

NOTE

If the part to be cleaned is too large or it is considered impractical to use a vapor degreaser, clean it with cloths (C104) soaked in naphtha (C218) or equivalent type solvents.

(b) Immerse parts in alkaline cleaning solution, maintained at 180° to 210°F to (82° to 99°C), for 5 to 15 minutes or until all visible soil is removed.

(c) Rinse parts thoroughly with cold water and inspect for breaks in the water film. If any breaks occur in film, repeat step (b).

(d) Immerse parts in chromic acid solution, maintained at 165° to 210°F to (74° to 99°C), for 10 to 15 minutes. Rinse them thoroughly with cold water. If necessary, the chromic acid solution may be maintained at 70°F (21°C); however, longer immersion times may be necessary.

NOTE

Newly applied finishes can be removed by this procedure. Very old finishes may require additional alternate immersion in alkaline cleaning and chromic acid solutions for complete removal of finish.

(e) Immerse parts in hydrofluoric acid solution. Immerse sheet stock for approximately 30 seconds. Immerse all other parts for 5 minutes. If parts contain aluminum inserts, immerse them for 5 to 15 minutes in sodium acid fluoride solution instead of hydrofluoric acid solution. Rinse all parts thoroughly in cold running water.

(f) Immerse parts in a dichromate solution, maintained at 200° to 220°F (93° to 104°C), for approximately 30 minutes.

(g) Rinse parts thoroughly and then dip them in hot water to facilitate drying.

NOTE

The dichromate treatment makes magnesium alloys corrosion-resistant and serves as an excellent base for paint.

(h) Refinish cleaned and treated parts as soon as possible.

d. Parts requiring touchup only can be chrome-pickle treated as follows:

(1) Clean parts by suspending them in a vapor degreaser, using trichloroethylene (C366) as the solvent. (Refer to para 1-35.)

(2) If a vapor degreaser is not practical, clean the part with cloths (C104) soaked in naphtha (C218) or equivalent type solvents.

(3) Prepare one of the following chrome-pickle solutions.

(a) Solution I. Mix 1½ pounds of sodium dichromate (C316) and 1½ pints of nitric acid (C11) to a sufficient amount of water to make 1 gallon of solution.

(b) Solution II. Mix 1 pound of chromic acid (C97) and 0.9 pint of nitric acid to a sufficient amount of water to make 1 gallon of solution.

(4) Immerse and agitate the parts in either of the solutions for 1 to 2 minutes.

(5) Remove the parts from the solution and expose them to air for 5 to 10 seconds. Rinse them with cold water. Dip parts in hot water to speed drying.

(6) If a part is too large for dipping, apply the solution by brushing. Allow the solution to remain on the surface for 1 to 2 minutes. Wash the part with a cloth (C104) soaked with water.

1-39. Cleaning Aluminum and Aluminum Alloy Parts (AVIM). Subsequent steps contain information on the preparation of cleaning solutions and the procedures for degreasing and cleaning the parts. Use this procedure when an extremely clean surface is necessary, such as prior to welding, or when bonding large areas of aluminum.

WARNING

Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Avoid contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

WARNING

Trichloroethylene and perchloroethylene are toxic and highly flammable. Work in a well ventilated area away from open flame. Avoid inhaling fumes and prolonged contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

a. Preparation of cleaning solutions. Prepare the solutions, using the recommended quantities and equipment. (Refer to subsequent steps.)

(1) Preparation of sulfuric acid sodium dichromate solution.

(a) Pour 30 parts, by weight, of cold water into a tank.

(b) Add 10 parts, by weight, of sulfuric acid (C12) to water in tank.

(c) Add 4 parts, by weight, of sodium dichromate (C316) to solution in tank.

(d) Stir solution until sodium dichromate has dissolved.

(2) Preparation of Oakite No. 61 (C221) solution.

(a) Add 5 ounces of Oakite 61 (C221) crystals to each gallon of water used. Stir the water while adding crystals.

(b) Heat solution to 175° to 185°F (70.5° to 85°C) to dissolve crystals.

b. Degreasing procedure. Prior to cleaning, degrease the parts as follows:

(1) Suspend part in a vapor degreaser, using either perchloroethylene (C242) or trichloroethylene (C366) as the solvent, until all grease and other matter has been removed. (Refer to para 1-35.)

(2) If a vapor degreaser is not practical, degreasing can be accomplished using cloths (C104) soaked with naphtha (C218).

NOTE

Acetone (C9) or methyl-ethyl-ketone (C216) may be substituted for naphtha if contamination is silicone-treated.

c. Cleaning procedure. Clean parts, using prepared solutions of Oakite 61 (C221) and sulfuric acid-sodium dichromate as follows:

(1) Immerse part in the Oakite 61 (C221) solution 5 to 10 minutes. Maintain a solution temperature of 160° to 210°F (71° to 99°C) for this period.

(2) Remove part from solution and rinse it with water.

(3) Inspect for any breaks in water film. If any break occurs, repeat degreasing procedure in step b. and repeat steps (1) thru (3).

(4) Immerse parts in sulfuric acid-sodium dichromate solution 10 to 20 minutes. Maintain a solution temperature of 150° to 170°F (66° to 77°C) for this period.

(5) Remove part from solution, rinse it thoroughly with water and allow it to dry.

(6) Wrap part with barrier material (C67).

NOTE

If recleaning is necessary, the immersion time in steps (1) and (4) may be reduced by one-half. Clean parts must be handled with clean gloves at all times.

1-40. Cleaning Plastic-Impregnated Glass Cloth Parts. Subsequent steps contain information on routine cleaning where abrasive polishing for removal of scratches is not required.

a. Prepare a mild solution of soap (C311) and water.

NOTE

Naphtha (C218) or solvent (C137) may be substituted for soap and water solution.

CAUTION

Do not use dirty or gritty cloths, unapproved cleaning fluids, compounds, solvents, etc., as they can damage the surfaces.

b. Saturate cloths (C104) with the solution and lightly rub the surface.

c. If a soap and water solution is used, rinse surfaces with a clean, water-soaked, flannel cloth (C108). Wipe the surface dry with a clean flannel cloth.

1-41. Cleaning Transparent Acrylic Plastic Parts. For information on cleaning interior and exterior surfaces of windows, windshields, and enclosures, refer to TM 55-1500-333-24.

1-42. Deleted.

1-43. List of Consumable Materials.

Consumable maintenance supplies and materials are listed in table 1-5 in alphabetical order. Each consumable also has an item number assigned for ease of location and reference. When an item number is unknown you may locate any consumables used within this manual thru its alphabetical arrangement. When an item number is referenced in the manual, you may locate the item thru its C designator and item number. C designators are used only with consumable maintenance supplies and materials. Consumable maintenance supplies and materials tables are found only in this chapter; therefore, the table number will not be referenced in the text.

1-44. Special Tools and Test Equipment.

Special tools and test equipment are listed in table 1-6 in alphanumeric order. Each tool or piece of test equipment has an item number assigned for ease of location and reference. When an item number is unknown, you may locate special tools and test equipment thru alphanumeric arrangement within the table. When an item is referenced in the manual, you may locate the item thru its T designator and item number. T designators are used only with special tools and test equipment. The special tools and test equipment table is found only within this chapter; therefore, the table number will not be referenced within the text. A complete listing of all special tools and test equipment authorized for use to perform maintenance on CH-47B and CH-47C aircraft accessories are contained in the aircraft parts manuals. When a tool requires special instructions or visual aid in its application or use, a reference is made to the appropriate figure showing the tool usage.

1-45. Support Equipment.

Refer to table 1-7 for ground support equipment required for aviation unit (AVUM) and intermediate (AVIM) level maintenance of the helicopter.

Table 1-5. List of Consumables

ITEM NO	DESCRIPTION	REF NO & FSCM	NSN
1	Abrasive cloth, aluminum oxide, grade 800	P-C-451	—
1.1	Abrasive mats, fine grade	MIL-A-9962	—
2	Abrasive pad, Scotch Brite type A, Minnesota Mining and Mfg. Co. (or equiv)	—	7910-00-755-5242
3	Abrasive paper, silicon carbide, waterproof, No. 0000	P-P-101	—
3.1	Abrasive paper, silicon carbide, waterproof, 60-grit	P-P-101	5350-00-619-9168
3.2	Abrasive paper, silicon carbide, waterproof, 80-grit	P-P-101	5350-00-721-8115
3.3	Abrasive paper, silicon carbide, waterproof, 120-grit	P-P-101	5350-00-721-8116
3.4	Abrasive paper, silicon carbide, waterproof, 180-grit	P-P-101	5350-00-224-7207
3.5	Abrasive paper, silicon carbide, waterproof, 240-grit	P-P-101	5350-00-224-7205
3.6	Abrasive paper, silicon carbide, waterproof, 280-grit	P-P-101	5350-00-224-7203
3.7	Abrasive paper, silicon carbide, waterproof, 320-grit	P-P-101	5350-00-224-7202
3.8	Abrasive paper, silicon carbide, waterproof, 360-grit	P-P-101	5350-00-224-7201
3.9	Abrasive paper, silicon carbide, waterproof, 400-grit	P-P-101	—
3.10	Abrasive paper, silicon carbide, waterproof, 420-grit	P-P-101	5350-00-224-7215
3.11	Abrasive paper, silicon carbide, waterproof, 600 grit	P-P-101	—
4	Deleted		—
5	Deleted		—
6	Deleted		—
6.1	Accelerator, German, for 00063 cement, Goodyear Tire and Rubber Co. (or equiv)	—	—
7	Accelerator, 1465C, for 1462C cement, Goodyear Tire and Rubber Co. (or equiv)	—	2640-00-856-7155
8	Accelerator, 611, for 610 filler resin, Palmer Products Co., Inc. (or equiv)	—	—
8.1	Accelerator, for cement, Goodyear Tire and Rubber Co. (or equiv)	1895C	8040-01-028-9866
9	Acetone, technical	O-A-51	6810-00-184-4796
10	Acid, acetic, glacial technical	O-A-76D	6810-00-275-1215
11	Acid, nitric, technical	O-N-350	6810-00-237-2918
12	Acid, sulfuric, technical	O-S-809	6810-00-251-8007
13	Deleted	—	—
14	Deleted — use items 48.1 and 48.2	—	—
15	Adhesive, bonding, vulcanized synthetic rubber-to-steel	MMM-A-121	8040-00-664-0439
16	Deleted — use item 32		—
17	Deleted	—	—
18	Adhesive, Q-3-0121, type 60, Dow Corning Corp. (or equiv)	—	—
19	Deleted	—	—
20	Adhesive, Pliogrip No. 3, Goodyear Tire and Rubber Co. (or equiv)	—	8040-00-018-7581
21	Deleted — use item 88 or 90	—	—
22	Deleted — use item 23	—	—
23	Adhesive consisting of: Component AB, Hysol 4405; and Component CD, Hysol 3538, Hysol Corp. (or equiv)	—	8040-00-104-9505 8040-00-104-5292
24	Adhesive consisting of: Component AB, J1170-1; and Component CD, E-18-1, Armstrong Cork Co. (or equiv)	—	—
25	Adhesive consisting of: Component AB, Sa Co 2862 (Component 1); and Component CD, Sa Co 2862 (Component 2), Sherwood and Co., Inc. (or equiv)	—	—
26	Adhesive consisting of: Component AB, XS-1175625A; and Component CD, XS-1175625B, Minnesota Mining and Mfg. Co. (or equiv)	—	—
27	Adhesive consisting of: Component AB, 185-C-417; and Component CD, 185-C-418, W.P. Fuller Paint Co. (or equiv)	—	—
28	Adhesive consisting of: Component AB, 522; and Component CD, 542, Technical Research Co. (or equiv)	—	—
29	Adhesive consisting of: 190-H-1 Resin and 191-B-10 Catalyst, W.P. Fuller and Co. (or equiv)	—	—
30	Adhesive consisting of: 190-H-1 Resin and 191-C-21 Catalyst, W.P. Fuller and Co. (or equiv)	—	—
**30.1	Adhesive, EA9309.3, N/A Mini-Sem Kit, Semco 678	—	
30.2	Adhesive, EA9309.3 N/A Hysol Corp.	—	
31	Deleted		
**32	Adhesive, EC-2216, parts A and B, Minnesota Mining and Materials Mfg. Co. (or equiv)	MMM-A-132	8040-00-145-0019
33	Deleted — use item 88 or 90	—	—
34	Adhesive, EC-776 or EC-1309, Minnesota Mining and Mfg. Co. (or equiv)	—	8040-00-809-8252
35	Deleted	—	—
36	Deleted	—	—
37	Adhesive, EPON VI	MMM-A-134	8040-00-205-4590
38	Deleted	—	—
39	Adhesive, EPON 828, GRA class 3	MMM-A-134	8030-00-086-1506
40	Adhesive, EPON 901, Shell Chemical Co. (or equiv)	—	8040-00-851-3405
41	Adhesive, fuel cell repair, class L	MIL-A-9117B	8040-00-262-9060
42	Adhesive, fuel cell repair	82C18	8040-01-129-2559
43	Adhesive pack, No. 8055-63, Fenwal Laboratories (or equiv)	—	—

Table 1-5. List of Consumables (Continued)

ITEM NO	DESCRIPTION	REF NO. &FSCM	NSN
44	Adhesive, ProSeal 719B-1/2, 719B-2, and 719B-4, Coast ProSeal and Mfg. Co. (or equiv)	—	—
45	Adhesive, ProSeal 501, Coast ProSeal and Mfg. Co. (or equiv)	—	8040-00-128-7798
46	Adhesive, PR1710, Products Research Corp. (or equiv)	—	8040-00-142-9721
47	Adhesive, PR9021 B-2 and PR9021 B-4, Products Research Co. (or equiv)	—	8030-00-174-3190
48	Adhesive, Q-2 0046, Dow Corning Corp. (or equiv)	—	8030-00-843-4806
48.1	Adhesive, room temperature curing, SRC-10 catalyst, General Electric Corp. (or equiv.)	—	—
48.2	Adhesive, room temperature curing, SR-529 resin, General Electric Corp. (or equiv)	—	—
49	Adhesive, Teroco No. 68, Technical Research Co. (or equiv)	—	—
50	Adhesive, Uralane 5716, Parts A and B, Furane Plastics (or equiv)	—	-
51	Adhesive, Uralane 8089, Parts A and B, Furane Plastics (or equiv)	—	8040-00-828-4936
51.1	Adhesive, EA934, Shell Chemical Co. (or equiv)	–	8040-00-016-8662
52	Adhesive, Polyurethene, EC3549BA	—	8040-01-016-4726
53	Deleted	—	–
54	Alcohol, isopropyl, commercial grade	TTT-I-735	6810-00-855-6160
55	Alodine 1200 powder, American Chemical Co. (or equiv)	MIL-C-81706	8030-00-057-2354
55.1	Alodine 1200 solution, American Chemical Co. (or equiv)	—	8030-00-613-3131
55.2	Aluminum foil	L-T-80	
56	Aluminum rod 2024, 0.25 in. dia	QQ-A-225/6	9530-00-228-9312
56.1	Aluminum sheet, 0.032 inch thick	QQ-A-250	
56.2	Aluminum sheet, 0.040 inch thick	QQ-A-250	
57	Aluminum wool, types II & III	MIL-A-4864	5350-00-286-4851
58	Deleted	—	—
59	Ammonium hydroxide, technical	O-A-451	6810-00-222-9643
60	Anti icing and deicing-defrosting fluid	MIL-A-8343	6850-00-901-0591
61	Deleted	—	—
62	Antiseize compound, molybdenum disulfide-petrolatum	MIL-T-83483	8030-00-087-8630
63	Deleted — use item 62	—	—
64	Deleted—use item 65	—	—
65	Antiseize and thread sealing compound, oxygen systems	MIL-T-5542	8030-00-530-5234
••• 65.1	Antistatic coating, Task Research Inc.	—	1615-01-205-6138
66	Bake coating, EV-6174, Bee Chemical Co. (or equiv)	—	—
67	Barrier material, grade A	MIL-B-121	8135-00-753-4661
68	Barrier material, water vapor proof, class I	MIL-B-131	8135-00-281-0565
69	Deleted	—	—
70	Boric acid, ACS	MIL-STD-1218	6810-00-264-6535
71	Buffing and polishing compound, type III, grade A	MIL-C-16909	5350-00-225-5581
72	Buffing compound, Learock No. 5-30, Lea Mfg. Co. (or equiv)	—	—
73	Buffing compound, Learock No. 888, Lea Mfg. Co. (or equiv)	—	5350-00-165-7145
73.1	Cable, special purpose	MIL-W-5846	6145-00-643-0252
74	Cable, special purpose, electrical	MS25313A201	6145-00-901-6843
75	Cable, special purpose, electrical, single conductor	M7078-3-22-1	6145-00-608-5484
75.1	Cable, special purpose, electrical, 2 conductor	MIL-C-27500	6145-00-617-0858
76	Deleted	—	—
77	Calcium fluoride, powder reagent	MIL-C-11162	6810-00-262-8574
77.1	Calcium sulphate	—	—
78	Carbon dioxide, technical, solid (dry ice)	BB-C-104B	6830-00-247-0619
79	Castor oil, technical	JJJ-C-86	9150-00-995-1928
80	Catalyst B1, for EPON 901, Shell Chemical Co. (or equiv)	—	8030-00-944-6479
81	Catalyst B3, for EPON 903, Shell Chemical Co. (or equiv)	—	—
82	Deleted	—	—
83	Catalyst, PS-18, component B	MIL-A-8576	8040-00-266-0215
84	Cellophane, sheet, commercial grade	L-C-110	
85	Deleted	—	—
86	Cement, EC1128, Minnesota Mining and Mfg. Co. (or equiv)	—	8040-00-917-9932
87	Deleted	—	—
88	Cement, M6249, US Rubber Co. (or equiv)	—	—
89	Cement, PS-18	MIL-A-8576	—
90	Cement, ProSeal 590M, Coast ProSeal Mfg. Co. (or equiv)	—	8040-00-515-2250
91	Cement, rubber, silicone, part 92-018, Dow Corning Corp. (or equiv)	—	8040-00-057-4108
92	Cement resin, PS-18, component A	MIL-A-8576	8040-00-526-1910
93	Deleted	—	
93.1	Deleted	—	—
93.2	Deleted	—	—
93.3	Deleted	—	—
93.4	Chalk, marking	SS-C-266	—
94	Chamois leather, sheepskin, oil tanned	KK-C-300	8330-00-823-7545
95	Cheesecloth, type 2, class B	CCC-C-440	8305-00-267-3015

Table 1-5. List of Consumables (Continued)

ITEM NO	DESCRIPTION	REF NO & FSCM	NSN
96	Chemical films and chemical film materials for aluminum and aluminum alloys, class 1A	MIL-C-5541	8030-00-811-3725
97	Chromic acid (chromium trioxide) technical grade	O-C-303	8030-00-264-6517
98	Cleaner, glass, liquid, type I, class 1	P-G-406	7930-00-664-6910
99	Cleaner, Ultrasene, Atlantic Refining Co. (or equiv)	—	—
100	Cleaning compound, aircraft surface, alkaline water base	MIL-C-25769	6850-00-935-0995
100.1	Cleaning compound, aircraft surface	MIL-C-43616	6850-00-144-9816
101	Cleaning compound, aluminum surface, non-flame-sustaining	MIL-C-5410	6850-00-628-7249
102	Deleted	—	—
103	Cleaning compound, windshields, Indasil 21, Indasil Co. (or equiv)	P-C-438	6850-00-935-0985
103.1	Cloth, bunting	CCC-C-476	—
104	Cloth, cleaning	CCC-C-46A	8305-00-753-2967
105	Cloth, cotton, airplane	MIL-C-5646	8305-00-191-3977
106	Cloth, crocus	P-C-458	5350-00-221-0872
107	Cloth, emery, No. 120-grit, commercial grade	GGG-C-520	5350-00-865-5688
107.1	Cloth, emery, No. 180-grit, commercial grade	GGG-C-520	5350-00-881-3933
107.2	Cloth, emery, No. 200-grit, commercial grade	GGG-C-520	5350-00-881-3582
107.3	Cloth, emery, No. 320-grit, commercial grade	GGG-C-520	5350-00-174-0997
107.4	Cloth, emery, No. 500-grit, commercial grade	GGG-C-520	5350-00-186-8855
108	Cloth, flannel, cotton	CCC-C-458	8305-00-222-2460
108.1	Cloth, glass, No. 128	MIL-C-9084	—
109	Deleted	—	—
110	Cloth, glass, No. 181	MIL-C-9084	8305-00-530-0109
111	Cloth, glass, No. 181-75	MIL-C-9084	—
111.1	Cloth, glass, No. 1500	—	
112	Cloth, glass finished, for polyester resin laminates	MIL-C-9084	—
113	Cloth, Holland, 5-ounce minimum weight per square yard	MIL-C-17564	8305-00-286-5050
114	Cloths, cotton and cotton-synthetic	DDD-R-30	—
114.1	Coating, epoxy, color No. 16081	MIL-C-22750	8010-00-112-0724
**114.2	Coating, epoxy, color No. 37038	MIL-C-22750	
114.3	Coating, anti-static (P/O kit 135.1 NSN 1615-01-180-26-24). Task Research Inc.	—	1615-01-205-6138
115	Deleted		—
116	Deleted		—
117	Deleted		—
118	Deleted		—
119	Deleted		—
120	Deleted		—
121	Deleted		
*121.1	Core, honeycomb, Nomex, CL-4, Type V, gr 3.0 full-depth, 36 inches long	—	
*121.2	Core, honeycomb, Nomex, CL-4, Type I, gr 2.0 full-depth, 36 inches long	—	
*121.3	Core, honeycomb, Nomex, CL-4, type V, gr 3.0, ½ x 17 x 36 inches	—	
*121.4	Core, honeycomb, Nomex, CL-4, type I, gr 2.0, ½ x 17 x 36 inches	—	
*121.5	Core, honeycomb, Nomex, CL-4, type V, gr 3.0, ¼ x 17 x 36 inches	—	
*121.6	Core, honeycomb, Nomex, CL-4, type I, gr 2.0, ¼ x 17 x 36 inches	—	
121.7	Core, honeycomb, Nomex, HRH-10-3/16-4.0, Hexcel Corp. (or equiv)	—	—
121.8	Core, honeycomb, Glass HRP 3/16-3.5 Hexcel Corp. (or equiv)	—	—
122	Cord, glass, class EC-6	MIL-Y-1140	4020-00-530-2757
123	Corrosion-preventive compound, type I and III, aircraft engine	MIL-C-6529	6850-00-204-7235
124	Corrosion-preventive compound, cold application, grade 1	MIL-C-16173	8030-00-244-1299
125	Corrosion-preventive compound, hot application, grade 3	MIL-C-11796	8030-00-576-8360
126	Corrosion-preventive concentrate, Brayco 599 (or equiv)	—	6850-00-142-9582
126.1	Corrosion-removing compound, type II	MIL-C-10578	6850-00-174-9672
127	Deleted — use item 96	—	—
128	Cotton, grade B	JJJ-C-561	—
128.1	Cup, polyethylene	—	—
129	Curing agent, diethylenetriamine, technical	O-D-1271	6810-00-995-4804
129.1	Curing Agent, polyamide versamid 140, Henkel Corp (or equiv)	—	8040-00-105-0826
130	Deleted	—	—
131	Descaling compound, alkaline, hot section jet engine parts	MIL-D-26549	6850-00-597-1520
132	Desiccant, activated, type I	MIL-D-3464	6850-00-264-6573
133	Deleted	—	—
134	Deleted	—	—
135	Deleted	—	—
136	Dry cleaning solvent, type I	P-D-680	6850-00-264-9037
137	Dry cleaning solvent, type II	P-D-680	6850-00-285-8011
138	Ease-Off 990, Tenneco Co. (or equiv)	—	8030-00-778-4277
139	Deleted	—	—
140	Deleted	—	—
140.1	Enamel, exterior grey, No. 27	MIL-E-15936	8010-00-079-2455

Table 1-5. List of Consumables (Continued)

ITEM NO	DESCRIPTION	REF NO & FSCM	NSN
141	**Ethyl alcohol, denatured, grade III**	O-E-760	6810-00-823-8003
*141.1	**Fiberglass laminate skin, type II**	—	—
141.2	Fiberglass laminate skin, A02R1753-1	—	—
*142	**Fiberglass laminate skin, A02R1753-11**	—	—
*142.1	**Fabric, Teflon impregnated**	—	—
143	Deleted		—
144	Deleted		—
145	Filler, Cabo-Sil, Godfrey L. Cabot Inc (or equiv)	—	8010-00-060-5253
146	Filler, Corfil 615, Bloomingdale Rubber Co (or equiv)	—	8030-00-149-0137
147	Filler FR-7010A/B	26348	8040-01-137-8442
147.1	Filler, foam, Isofoam PE2, res PEW	—	
148	Deleted		—
149	Film, type I	MIL-B-22191	—
150	Fingerprint remover, corrosion preventive	MIL-C-15074	8030-00-664-4017
151	Fluid, damping, DC510, viscosity 500 cstk, Dow-Corning Corp	—	9150-00-180-5975
151.1	Fluid, damping, DC510, viscosity 1000 cstk, Dow-Corning Corp	—	9150-00-024-9623
152	Deleted		—
153	Flux, type I, soldering	MIL-F-20329	3439-00-250-2635
154	Deleted		—
155	Foam, G-300, Napco Chemical Co (or equiv)	—	—
156	Foam, G-306, Napco Chemical Co (or equiv)	—	9330-01-006-5310
156.1	Deleted		—
157	Foam, Polyurethane, sheet, density grade II	MIL-F-81334	9330-01-008-7428
158	Fuel, turbine, grade JP-4 or JP-5	MIL-J-5624	9130-00-256-8613
159	Gauze, absorbent, wrapping, class I	CCC-G-101	
159.1	Gauze, sponges, surgical	—	—
160	Glycerol, technical high gravity	O-G-491	6810-00-264-6548
161	Deleted — use item 210		—
162	Grease, aircraft and instrument, gear and actuator screw	MIL-G-23827	9150-00-985-7247
163	Grease, aircraft, gen purpose, wide temp range	MIL-G-81322	9150-00-145-0268
164	Deleted — use item 163		—
165	Deleted — use item 163		—
166	Deleted — use item 163		—
167	Deleted — use item 163		—
168	Grease, plug valve, gasoline & oil resist, Type I	MIL-G-6032	9150-00-257-5360
169	Deleted — use item 163		—
170	Hardener, Araldite 957, Ciba Products Corp (or equiv)	—	—
171	Hardener, Epoxide 206, Union Carbide Corp (or equiv)	—	—
172	Hardener, N, N, dimethylbenzylamine, Eastman Chemical Products, Inc (or equiv)	—	—
172.1	Hardener, Versamid 125	—	—
173	Heat sink compound, Dow Corning No. 340 (or equiv)	—	—
174	Deleted		—
175	Hydraulic fluid, petroleum base, aircraft, OHA	MIL-H-5606	9150-00-223-4134
176	Hydraulic fluid, petroleum base, preservative	MIL-H-6083	9150-00-159-4472
177	Hydraulic fluid, fire resistant	MIL-H-83282	—
178	Hydrofluoric acid, anhydrous	—	—
179	Hydrofluoric acid, technical	O-H-795	6810-00-543-4012
180	Deleted		—
181	Insulation sleeving, electrical, flexible, type I, class I	MIL-I-7444	—
182	Ink, marking, stencil, opaque, for non-porous surface	TT-I-1795	—
183	Jacket (molded shape), neoprene, type BN, class II	MIL-S-6855	—
184	Kantfray, Aero Leather Products Co (or equiv)	—	—
185	Deleted		—
186	Lacquer, acid resistant, spraying (black or white)	TT-L-54	8010-00-582-5382
187	Lacquer, aluminized	—	—
188	Deleted	-	—
189	Deleted		—
190	Lacquer, black, color No. 37038	TT-L-20	8010-00-515-1568
191	Lacquer, acrylic, lusterless black, color No. 37038	MIL-L-19538	8010-00-527-2884
192	Lacquer, acrylic, gloss black, color No. 17038	MIL-L-19537	8010-00-527-2507
193	Lacquer, acrylic, gloss blue, color No. 15042	MIL-L-19537	8010-00-551-7933
194	Deleted		—
195	Lacquer, acrylic gloss green, color No. 14187	MIL-L-19537	8010-00-527-2483
196	Lacquer, acrylic, lusterless olive drab, color No. X34087	MIL-L-19538	8010-00-082-2479
197	Lacquer, acrylic gloss orange-yellow, color No. 13537	MIL-L-19537	8010-00-527-2496
198	Lacquer, acrylic gloss insignia red, color No. 11137	MIL-L-19537	8010-00-551-7934
199	Lacquer, acrylic gloss white, color No. 17875	MIL-L-19537	8010-00-527-2493
200	Lacquer, acrylic lusterless white, color No. 37875	MIL-L-19538	8010-00-530-6387
201	Lacquer, acrylic gloss yellow, color No. 13655	MIL-L-19537	8010-00-527-2496
202	Leak detection compound, type I	MIL-L-25567	6850-00-631-1819

Table 1-5. List of Consumables (Continued)

ITEM NO.	DESCRIPTION	REF NO. & FSCM	NSN
206	Lockwire, monel, 0.032 inch	MS20995NC32	9525-00-803-3044
207	Deleted — use item 207.1		—
207.1	Lockwire, monel, 0.040 inch	MS20995NC40	9525-00-990-7799
208	Lubricant, molybdenum disulfide powder	MIL-M-7866	6810-00-264-6715
209	Lubricant, penetrating, CRC 5-26 (or equiv)	—	9150-00-261-7899
210	Lubricant, solid film, air drying	MIL-L-23398	9150-00-754-0064
211	Lubricant, surgical	—	—
212	Lubriplate, Fiske Brothers Refinery Co (or equiv)	—	9150-00-076-1574
213	Material, cushioning, cellulosic, type II, class C	PPP-C-843	2135-00-183-8814
214	Metal conditioner and rust remover (phosphoric acid base), type I	MIL-M-10578	6850-00-174-9672
215	Methanol (methyl alcohol), technical, grade B	O-M-232	6810-00-174-5190
216	Methyl-ethyl-ketone, technical	TT-M-261	6810-00-281-2785
216.1	Mold release (parting compound), type I	MIL-P-22093	—
217	Naphtha, aliphatic	TT-N-95	6810-00-238-8117
218	Naphtha, aromatic	TT-N-97	6810-00-223-9067
219	Nitrogen, type II, grade B (liquid)	BB-N-411	9135-00-823-8115
220	Nitrogen, type I grade B (gas)	BB-N-411	6830-00-292-0131
221	Oakite, No. 61, Oakite Products Inc	P-C-436	6850-00-664-7530
222	Oil, general purpose, preservative	VV-L-800	9150-00-231-6689
223	Oil, lubricating, grade 1010	MIL-L-6081	9150-00-231-6676
224	Oil, lubricating, aircraft reciprocating engine, grade 1065	MIL-L-6082	9150-00-965-2305
225	Oil, lubricating, aircraft turbine engine, synthetic base, 0-156	MIL-L-23699	9150-00-983-7099
226	Oil, lubricating, aircraft turbine engine, synthetic base, 0-148	MIL-L-7808	9150-00-782-2627
227	Oil, lubricating, corrosion preventive, synthetic base	MIL-C-8188	—
228	Oil, lubricating, gear, multi-purpose, grade 80W/90	MIL-L-2105	9150-00-577-8541
229	Oil, lubricating, instrument	MIL-L-6085	9150-00-223-4129
230	Paint, non-skid, Epolux 100E6AS (or equiv)	—	8010-00-866-6810
230.1	Paint, 80029, Goodyear Tire and Rubber Co. (or equiv)	—	—
231	Deleted		—
232	Paint remover, nonflammable	TT-R-248	—
233	Paint system, fluorescent, removable, daylight, color No. 633	MIL-P-21600	8010-00-082-2421
234	Paper, wrapping, untreated, kraft	UU-P-268	8135-00-160-7759
235	Paper tag	UU-T-81	8135-00-292-2345
236	Parting agent, Delco X-769 (or equiv)	—	—
237	Parting agent, VYDAX-550 (or equiv)	—	6850-00-341-8430
238	Paste, lapping, grade 388-900A	—	5350-00-587-3410
238.1	Paste, (putty) zinc chromate	MIL-P-8116	—
239	Patch, inside, FT-136, Goodyear Tire and Rubber Co., P/N 5200-5187-5194 (Uniroyal) (or equiv)	—	8305-00-350-5592
240	Deleted		—
*240.1	Peel ply, style No. 661 Miltex Industries Inc.	—	—
241	Deleted		—
242	Perchlorethylene (tetrachloroethylene), technical	O-T-236	6810-00-819-1128
243	Permatex, No. 1372, Permatex Co. Inc. (or equiv)	—	8030-00-599-7753
244	Petrolatum, technical	VV-P-236	9150-00-250-0926
245	Phenolic sheet, laminated, type FMB, 3/4" thick	MIL-P-15035	—
246	Phenolphthalein crystals, commercial grade	O-C-265	6810-00-223-7612
247	Pigment, iron-blue, dry	—	—
248	Plastic, nylon, flexible, molded or extruded	MIL-N-18352	—
249	Plastilube, Moly No. 3, Warren Refining Co (or equiv)	—	9150-00-889-3516
250	Polish kit, glass, RS-69, Micro-Surface Finishing Products Inc	MIL-M-38091	1560-00-450-3622
251	Polish, plastic, type I	P-P-560	—
252	Polyamide, nylon, plastic, rigid, rods and flats	L-P-410	—
*252.1	Polyvinyl sheet, 0.002 inch thick PVA	—	
253	Deleted		
254	Potassium dichromate	—	6810-00-264-6525
254.1	Potting Compound	PRP1460	—
255	Deleted		—
256	Powder, solvent, TA 58056, Mine Safety Appliance Co. (or equiv)	MIL-C-372	6850-00-224-6658
257	Deleted		
257.1	Primer, coating, consisting of 513-707 base and 910-787 curing solution, DeSoto Inc	—	
258	Primer coating, vinyl-zinc chromate	MIL-P-15930	8010-00-664-0018
259	Primer coating, zinc chromate, composition L	TT-P-1757	8010-00-297-0593
**259.1	Primer, epoxy	MIL-P-23377	8010-00-082-2450
260	Primer, fast-drying, cellulose-nitrate, alkyd	MIL-P-7962	8010-00-526-2523
261	Primer sealing, grade T	MIL-S-22473	8030-00-081-2335
262	Primer H, for Uralane 5716 or 8089 (or equiv)	—	8040-00-104-8225
263	Primer J, for Uralane 5716 or 8089 (or equiv)	—	—

Table 1-5. List of Consumables (Continued)

ITEM NO	DESCRIPTION	REF NO. & FSCM	NSN
264	Primer, PR1711, Products Research Corp. (or equiv)	—	—
265	Primer, RTV1200 use with Q-3-0121, Dow-Corning Corp.	—	—
266	Primer, wash, for metals, formula No. 117 (metric)	DOD-P-15328	—
267	Primer, 90-198 Dow Corning Corp. (or equiv)	—	—
268	Promoter, PS-18, component C	MIL-A-8576	—
269	Deleted		—
270	Deleted		—
271	Rain repellant and/or parting agent, Vydax-550, Du Pont, E.I. De Nemours (or equiv)	—	6850-00-139-5297
272	Release agent, fluorocarbon dry lube, part S-122, Miller-Stephenson Chemical Co. or Rulon Spray, Connecticut Hard Rubber Co. (or equiv)	—	
273	Deleted		
274	Resin, Celanese Plastics (or equiv)	–	8040-00-949-6707
275	Resin compound, 611, Palmer Products Co., Inc. (or equiv)	—	
276	Resin, Epon 812, Shell Chemical Co. (or equiv)	—	8040-00-835-7328
277	Deleted		
278	Rod, Inconel No. 62 (or equiv)	—	
279	Rod, Welding, aluminum and aluminum alloys, class 4043	QQ-R-566	3439-00-269-9654
280	Rouge, No. 0000	—	5350-00-223-5581
281	Deleted		
282	Deleted		
283	Rubber, sheet, sponge, silicon, 0.032 inch	AMS-3195	9320-00-069-5177
284	Deleted		
285	Rubber sheet, silicon, 0.25 inch thick	—	
286	Rust inhibitor and preservative, LPS-2	—	8030-00-744-1293
286.1	Rubber, silicone, class III, grade 50, color light to medium gray	—	—
287	Screen 0.040 inch perforated grill, diamond pattern, 0.5 inch wide x 0.75 inch long Diamond Mfg. Co. (or equiv)	—	9535-00-465-8553
288	Deleted		
*289	Scrim cloth, HS-32, FMC91775, Hess and Goldsmith (or equiv)	—	8305-00-443-5601
290	Scrim cloth, nylon, EP-15, Travis Mills Corp (or equiv)	—	8305-00-178-6825
291	Sealant, retaining, single component, grade H	MIL-S-22473	
292	Sealant, retaining, single component, grade A	MIL-S-22473	
292.1	Sealant, retaining, single compound, grade AA	MIL-S-22473	
293	Deleted		
294	Sealant, gasket, hydrocarbon fluid, water resistant	MIL-S-45180	8030-00-252-3391
295	Sealant, elastomeric, aircraft structure, class A	MIL-S-7124	
296	Sealant, integral fuel tanks and fuel cavities, high adhesion, accelerator required, class A	MIL-S-7502	8030-00-275-8117
297	Deleted		
298	Sealant, EC-801B-A, class A, Minnesota Mining and Mfg. Co. (or equiv)	—	8030-00-275-3199
299	Deleted — use item 301		
300	Deleted — use item 301		
**301	Sealant, ProSeal 890, Class B, Coast ProSeal Mfg. Co. (or equiv)	MIL-S-8802	8030-00-685-0915
302	Sealant, ProSeal 719A-2, Coast ProSeal Mfg. Co. (or equiv)	—	—
303	Sealant, 3145 RTV, Dow Corning (or equiv)	MIL-A-46146	8040-00-144-9774
304	Sealant, ProSeal 700, Coast ProSeal Mfg. Co. (or equiv)	—	8030-00-723-5345
305	Sealant, type 2, class B-1/2	MIL-S-8802	8030-00-080-1649
305.1	Sealant, 730 RTV Dow Corning Corp.	—	—
305.2	Sealant, GE RTV 102 or Dow-Corning 732	—	
306	Sealant, grade C, Locktite Corp. (or equiv)	—	8030-00-823-7917
307	Sealant Tape, EC1202, Minnesota Mining and Mfg. Co. (or equiv)	—	—
308	Sealer, polysulfide, grade A	MIL-S-8802	—
309	Sealing compound, EC776S, topcoat, fuel tank, BUNA-N type	MIL-S-4383	—
310	Deleted		—
311	Soap, toilet, liquid, type I	P-S-624	8520-00-682-7320
312	Soap, toilet, white, floating, type I	P-S-620	8520-00-531-6484
313	Soapstone, powdered or mica, commercial grade	—	8510-00-817-0295
314	Sodium acid fluoride	—	8510-00-231-3006
315	Sodium bicarbonate, technical	O-S-576	6810-00-264-6618
316	Sodium dichromate, dihydrate, technical	O-S-595	6810-00-143-2000
317	Sodium hydroxide, technical	MIL-S-13085	6810-00-270-8177
318	Deleted		—
319	Solder, lead-tin alloy, type K, 50/50	QQ-S-571	3439-00-141-8244
320	Solution, cadmium alkaline plating, Sifco Metachemical Inc. (Dalic); Marlane Development Corp. (Selectron) (or equiv)	—	—
321	Deleted		—
322	Solution, ruststripper, grade 2, type 2, Oakite Products Inc. (or equiv)	TT-C-492	6850-00-810-1762
323	Solution, zinc-cleaning, Dalic, Sifco Metachemical Inc. (or equiv)	—	—

Table 1-5. List of Consumables (Continued)

ITEM NO.	DESCRIPTION	REF NO. & FSCM	NSN
324	Solution, zinc-plating, Dalic, Sifco Metachemical Inc. (or equiv)	—	—
324.1	Squeeze bottle, plastic	—	—
325	Steel, sheet CRES, 0.040 in. thick, type 301	MIL-S-5059	9515-00-596-1727
326	Steel, sheet, 4130, 0.032 in. thick	MIL-S-18729	9515-00-640-4146
326.1	Steel tubing, 431 CRES, HT 115	MIL-S-18732	
326.2	Steel tubing, 4130, 115 RSI	MIL-S-6758	
327	Steel wool, fine, commercial grade	—	5350-00-240-2920
328	Strap, plastic, line supporting, 0.190 x 6.50 x 0.055 in.	MIL-S-23190	—
329	Deleted		—
330	Strap, tiedown electrical components, adjustable, plastic type I, class 1	MS-3367	5975-00-074-2072
331	Strip, gum, 0.020 in. thick, 0.050 in. wide, No. 52904	—	—
•331.1	Surgeons gloves, S, sterile, disposable	MIL-G-36596	6515-00-264-7739
331.2	Syringe, hypodermic	MIL-S-36157	
332	Tape, anti-chafing, Y9265, Minnesota Mining and Mfg. Co. (or equiv)	—	—
333	Tape, anti-chafing permacel P-30b	99742	7510-01-009-8023
333.1	Tape, conductive, X1170 or X1181, Minnesota Mining and Mfg. Co. (or equiv)	—	
334	Tape, plastic, electrical, pressure-sensitive insulating	—	5970-00-604-2636
335	Tape, Falseal, Pittsburgh Plate Glass Co. (or equiv)	MIL-S-24391	7510-00-846-8674
336	Tape, glass cloth, type I	MIL-T-4053	7510-00-515-0319
337	Tape, masking, type I	PPP-T-42	7510-00-266-6707
338	Tape, Mylar (or equiv)	L-T-100	7510-00-105-3092
338.1	Tape, nylon, high temperature, No. 855, Minnesota Mining and Mfg. Co. (or equiv)	—	—
339	Deleted		—
340	Tape, pressure-sensitive adhesive, aluminum-backed	L-T-80	7500-00-720-7516
341	Tape, book, No. 80, slate grey 320, 1 inch wide	—	8315-00-926-1612
341.1	Tape, pile, No. 80, slate grey, 320, 1 inch wide	—	8315-00-935-0505
342	Tape, insulation, spiral wrap, 0.005 in. x 1.0 in.	MIL-I-18746	
343	Tape, pressure-sensitive adhesive, waterproof, Type IV	PPP-T-60	7510-00-074-5124
•343.1	Tape, sealing, zinc chromate	—	
344	Deleted	—	—
345	Tape, teflon spiral, Tireflex Co., Inc. (or equiv)	—	—
•346	Tape, teflon, self-adhesive	—	5970-00-848-8683
347	Tape, teflon, glass, Warren Wire Co. (or equiv)	MIL-I-18746	5970-00-181-0306
348	Deleted		—
349	Tape, yellow, ½-inch, type I, class B	L-T-90	7510-00-550-7125
350	Tape, red, ½-inch type I, class B	L-T-90	7510-00-550-7126
351	Tape, white, ¼-inch, type I, class B	L-T-90	7510-00-550-7127
352	Tape, green, ½-inch, type I, class B	L-T-90	7510-00-550-7129
353	Tape, blue, ¼-inch, type I, class B	L-T-90	7510-00-634-3267
354	Tape, black, ¼-inch, type I, class B	L-T-90	8135-00-880-7351
355	Tedlarfilm 100 GB30TR E.I. DuPont De Nemours (or equiv)	L-P-1040	—
356	Teflon sheet, type I, grade A	MIL-P-22241	—
356.1	Temperature indicating strips, 140-200°F, model 110, type 2, Teletemp Corp (or equiv)	—	
357	Deleted		
357.1	Thinner, acrylic monocellulose lacquer	MIL-T-19544	—
358	Thinner, logo, R-266, Bee Chemical Co. (or equiv)	—	—
359	Thinner, paint, type II	TT-T-291	8010-00-242-4079
359.1	Thinner, toluene-methyl-isobutyl-ketone	MIL-T-19588	—
360	Thread, cotton, 4-ply, size 10-3	V-T-276	8314-00-197-7695
361	Thread, nylon, type Ik, size B, class II, gray	V-T-295	—
362	Deleted — use item 363	—	—
363	Toluene, technical	TT-T-548	6810-00-281-2002
364	Tongue depressor, wood	111-S-00729	6515-00-753-4533
365	Deleted	—	—
366	Trichloroethylene, technical	O-T-634	6810-00-184-4800
367	Deleted	—	—
368	Tubing (extruded shape), synthetic rubber, ½ x 0.063 in, class 2, grade A	MIL-R-6855	4720-00-246-5354
369	Twine, impregnated, lacing and tying, type P, class 2	MIL-T-713	4720-00-247-1737
370	Varnish, electrical-insulating, Glyptal 1201	MIL-E-22118	5970-00-161-7421
371	Varnish, electrical-insulating, type AN, grade CB	MIL-I-24092	5970-00-166-8811
372	Varnish, moisture- and fungus-resistant, composition I	MIL-V-173	5970-00-285-0271
373	Vinegar, type II	Z-V-401	—
374	Deleted	—	—
375	Walkway material, type I (smooth) black, color No. 37038	MIL-W-5044	5610-00-641-0429
376	Walkway material, type I (smooth) gray, color No. 36231	MIL-W-5044	5610-00-641-0428
377	Walkway material, type II (rough) black, color No. 37038	MIL-D-24483	5610-00-516-0021
378	Walkway material, type II (rough) gray, color No. 36231	MIL-W-5044	5610-00-641-0426

Table 1-5. List of Consumables (Continued)

ITEM NO	DESCRIPTION	REF NO. & FSCM	NSN
*378.1	Wash bottle, laboratory, plastic, squeeze-type	MS-36070	
379	Wax, aircraft liquid	MIL-W-18723	7930-00-267-5588
380	Welding rod, N-155	AMS-5794	3439-00-882-7350
381	Welding rod, Hastellog W or X	AMS-ERN7W	
382	Window tinting compound, Windotint Green, Windotint Corp., Glazetone Green, National Glass Center, Inc (or equiv)	—	—
383	Wire, electrical, insulated copper, class I	MIL-W-7139	
384	Wire, electrical, aluminum, aircraft	MS25191-4B	6145-00-191-1526
385	Deleted	—	—
386	Wire, electric, nylon jacket, tin-coated copper 22	MIL-W-5086/1	6145-00-578-7520
386.1	Wire, electric, nylon jacket, tin-coated copper 20	MIL-W-5086/1	6145-00-578-7519
386.2	Wire, electric, nylon jacket, tin-coated copper 18	MIL-W-5086/1	6145-00-578-7518
386.3	Wire, electric, nylon jacket, tin-coated copper 16	MIL-W-5086/1	6145-00-578-7517
386.4	Wire, electric, nylon jacket, tin-coated copper 14	MIL-W-5086/1	6145-00-578-7516
386.5	Wire, electric, nylon jacket, tin-coated copper 12	MIL-W-5086/1	6145-00-578-7521
387	Wire, electric-pvc-glass-nylon, tin-coated 10	MIL-W-5086/2	6145-00-578-7513
387.1	Wire, electric-pvc-glass-nylon, tin-coated 8	MIL-W-5086/2	6145-00-578-0657
387.2	Wire, electric-pvc-glass-nylon, tin-coated 6	MIL-W-5086/2	6145-00-578-6594
387.3	Wire, electric-pvc-glass-nylon, tin-coated 4	MIL-W-5086/2	6145-00-578-6595
387.4	Wire, electric-pvc-glass-nylon, tin-coated 2	MIL-W-5086/2	6145-00-578-6596
388	Wire, electrical, type B, 105°C, 600 volts, insulated, high temperature	MIL-W-16878/1	
*388.1	Wire mesh, 120 mesh, Metex Corp	—	—
389	Xylene, grade A	TT-X-916	6810-00-584-4071
390	Zinlac, Wm Zinsler Co (or equiv)	—	—

NOTES

*Part of 114RK651-1 Fiberglass rotor blade repair kit

**Part of 114RK651-2 Cure dated fiberglass rotor blade repair kit

***Part of antistatic maintenance kit, rotor blade, Task Research Inc., NSN 1615-01-180-2624

Table 1-6. Special Tools and Test Equipment

ITEM NO	PART NO	NOMENCLATURE	USABILITY CODE	FIG. REF.
1	114E5100-1	Container, Aft Vertical Shaft		
2	114E5043-1	Clamp Assembly, Lag Damper	R/IN/S	1-24, 5-39
3	114E5110-185	Rack Set Assembly	S	1-24
4	114E5124-1	Hoist Assembly, Aft Transmission	R/IN	6-52
5	114E5128-3	Maintenance Crane	R/IN	1-41, 6-22
6	114E5130-49	Folding Pole	S	1-24
7	114E5802-1	Wrench Cap	R/IN	5-18
8	114E5803-1	Pusher, Rotor Head	IN	5-18
9	114E5804-1	Drift Housing, Rotor Hub		
10	114E5813-6	Puller, Bearing, Rotor Head	R	5-18
11	114E5814-7	Puller, Bearing and Seal, Rotor Hub	D/A	5-14
12	114E5824-4	Guide Set, Roller Bearing Seals, Rotor Hub	A	5-14
13	114E5840-1	Adapter, Rotor Head		
14	114E5852-16	Sling, Rotor Head	R/IN	5-87
15	114E5855-1	Sling, Aft Pylon	R/IN	2-113
16	114E5856-1	Skid, Vertical Pylon	R/IN/S	2-113
17	114E5856-22	Skid, Vertical Pylon	R/IN/S	2-113
18	114E5871-1	Adapter, Forward Transmission	R/IN	6-22
19	114E5872-35	Adapter, Powerplant	R/IN	4-15
20	114E5874-1	Adapter, Aft Transmission	R/IN	6-52
21	114E5878-49	Adapter, Vertical Shaft	R/IN	6-31
22	114E5879-41	Adapter, Rotary-Wing Set		
23	114E5888-1	Adapter, Combining Transmission	R/IN	6-44
24	114E5895-1	Wrench, Lower Bearing Nut, Aft Landing Gear Shock Strut		
25	114E5896-14	Wrench, Rotor Head Vertical Pin Nuts	R/IN	5-39
26	114E5897-11	Pin Set, Blade Folding Pitch Lock	S/AD	1-24
27	114E5898-5	Adapter Set, Rotor Head Lockout	R/IN	5-5
28	114E5899-19	Lifting Device, Rotor Head	R/IN	5-5

Table 1-6. Special Tools and Test Equipment (Continued)

ITEM NO.	PART NO.	NOMENCLATURE	USABILITY CODE	FIG. REF.
29	114E5900-14	Safety Blocks	R/IN/S	11-4, FO-35
29.1	114E5900-17	Safety Blocks (CH-47C only)	R/IN/S	11-4,FO-35
30	114E5902-9	Hoisting Eye, Forward Transmission and Aft Shaft	R/IN	6-23, 6-31
31	114E5902-11	Hoisting Eye, Forward Transmission and Aft Shaft	R/IN	6-23, 6-31
32	114E5905-1	Sling Assembly, Combining and Engine Transmissions	R/IN	6-44
33	114E5909-4	Ring Assembly, Forward Transmission and Aft Shaft		
34	114E5909-8	Ring Assembly, Forward Transmission and Aft Shaft		
35	114E5911-89	Sling, Handling, Rotary-Wing	R/IN	5-39
36	114E5916-3	Container, Combining Transmission		

Table 1-6. Special Tools and Test Equipment — Continued

ITEM NO.	PART NO	NOMENCLATURE	USABILITY CODE	FIG. REF.
37	114E5917-1	Container, Aft Transmission		
38	114E5918-8	Container, Engine Transmission		
39	114E5941-18	Rigging Tool, Cockpit Controls	A/IN/AD/I	11-8, 11-9, 11-14, 11-47, 11-49, 11-50, 11-51, 11-52
39.1	114E5963-1	Workstand Assembly, Rotorhead		
40	114E5970-33	Torque Plate, Aft Transmission	R/IN	6-52
41	114E5985-66	Rigging Set, First and Second Stage Mixing Linkage	A/AD	11-19, 11-21, 11-22, FO-36
42	114E5986-1	Test Set, Line, Trim and Stabilization System		
43	114E5986-5	Test Set, Line, Trim and Stabilization System		
44	114E5987-8	Test Set, Bench, SAS		
45	114E5988-1	Rate Table, SAS		
46	114E5989-5	Test Set, Bench, Speed Trim		
47	114E5990-6	Test Set, SAS Actuator		
48	114E5991-1	Drive Lock Assembly, Bolt, Forward Transmission	R/IN	6-24
49	114E5996-27	Securing Device, Aft Vertical Shaft	R/IN	6-52
50	114GS165-1	Mount, Limit Setting Fixture, Actuator		
51	114GS166-1	Adapter, Limit Setting, Trim Actuator		
52	114GS167-1	Backlash Checking Fixture, Trim Actuator		
53	114GS168-1	Limit Setting, Holding Fixture, Trim Actuator		
54	114GS169-1	Pulley, Load Test, Trim Actuator		
55	114GS170-1	Arm, Load Test, Trim Actuator		
56	114GS171-1	Test Panel, Air Seal, Trim Actuator		
57	114GS178-1	Test Adapter, Air Seal, Trim Actuator		
58	114GS196-1	Test Fixture, Oil Filter Body		
59	114GS198-1	Test Fixture, Oil Filter Body		
60	114GS215-1	Gage, Thimble, Heater	A	13-10
61	114GS216-1	Gage, Feeler, Heater	A	13-10
62	114GS217-1	Wrench, Socket, Heater		
63	114GS218-1	Blank Sleeve, Flight Control Hydraulic Manifold		
64	114GS219-1	Restrictor, Flight Control Hydraulic Manifold		
65	114GS220-1	Test Fixture, Flight Control Hydraulic Manifold		
66	114GS221-1	Test Fixture, Flight Control Hydraulic Manifold		
67	114GS222-1	Blank Element, Filter, Flight Control Hydraulic Manifold		
68	114GS223-1	Test Fixture, Oil Filter/Relief Valve Assembly		
69	114GS224-1	Test Fixture, Oil Filter/Relief Valve Assembly		
70	114GS225-1	Spanner Wrench, Viscous Damper	AD	11-69
70.1	114G0015-65	Container, Fiberglass Rotor Blades	HS	5-66.2
70.2	114G0018-1	Remover/Installer, Bushing Lag Damper Bracket	R/I	5-66.48, 5-66.49
70.3	114G0019-1	Vibrex Accessory Set	T	5-107.5
70.3.1	114G0019-3	Vibrex Accessory Set, Computerized Tracking and Balancing	T	5-217.12, 5-217.13
70.4	114G0020-1	Adapter, Fiberglass Rotor Blade Handling	HS	
70.5	114G0021-1	Fixture, Nickel Erosion Cap Repair	RP	5-66.54
70.6	114G0039-1	Tool Set, Receiver Tiepdown Fixture	R/I	
70.7	114G0017-1	Protective Cap, Vertical Pin Rotor Blade	I	
71	114G1009-63	Rigging Tool, Blade Angle Setting	IN/AD	11-4, 11-33
72	114G1013-1	Sling Assembly, Aircraft Hoisting	H	1-33
73	114G1014-1	Rigging Tool, Lead-Lag Damper	AD	1-24, 11-4
74	114G1014-11	Rigging Tool, Lead-Lag Damper	AD	1-24, 11-4
75	114G1015-1	Hydraulic Filtering Unit		
76	114G1017-49	Shipping Container, Rotary Wing Head	S/P	5-2
77	114G1017-50	Shipping Container, Rotary Wing Head	S/P	5-2
78	114G1018-1	Shipping Container, Forward Transmission		
79	114G1020-38	Skid, Transport, Rotor Hub		
79.1	114G1021-33	Transportation Stand Set — Rotary Wing		
80	114G1026-1	Work and Transportation Stand, Forward Transmission		
81	114G1026-34	Work and Transportation Stand, Forward Transmission		
82	114G1028-37	Container, Aft Vertical Shaft		
83	114G1030-6	Towing Bridle Assembly	H	1-28
84	114G1031-36	Skid Assembly, Aft Pylon Handling	R/IN/S	2-114
85	114G1032-9	Transportation Wheel, Forward Landing Gear		
86	114G1034-46	Steering Bar, Aft Landing Gear	H	1-28
87	114G1035-32	Transport Stand, Aft Transmission		
88	114G1036-1	Transport Stand, Engine		
89	114G1036-111	Transport Stand, Engine		
90	114G1037-1	Replacement Link, Flight Control System	R/IN	7-41
91	114G1038-71	Test Set, Hydraulic System		
92	114G1038-76	Test Set, Hydraulic System		
93	114G1038-86	Test Set, Hydraulic System		
94	114G1039-55	Test Fixture, Shock Absorber Assembly		

Table 1-6. Special Tools and Test Equipment — Continued

ITEM NO.	PART NO	NOMENCLATURE	USABILITY CODE	FIG REF
95	114G1045-1	Lifting Device, Aft Pylon		
96	114G1046-1	Cover Assembly, Protective, Combining Transmission		
97	114G1045-8	Safety Block, Landing Gear		
98	114G1048-29	Flap Restrainer, Rotary-Wing Folding	S/A	1-24
99	114G1049-14	Transport Tiedown Kit		
100	114G1050-1	Fitting Modification, Aft Landing Gear		
100.1	114G1093-12	Drill Fixture, Pitch Link	R	5-72
101	114G1102-11	Assembly Fixture, Pitch Link	A/AD	5-74
102	114G1131-1	Tool Kit, Extensible Link, Actuating Cylinder		
103	114G1137-10	Puller, Vertical Pin, Rotor Head	R	5-60
104	114G1143-1	Setting Fixture, NI and NII Actuator		
105	114G1143-23	Setting Fixture, NI and NII Actuator		
106	114G1144-1	Holding Fixture, Shock Absorber Assembly		
107	114G1146-1	Valve Test Block, Shock Absorbing Assembly		
108	114G1147-1	Valve Test Block, Shock Absorber Assembly		
109	114G1148-1	Valve Test Block, Shock Absorber Assembly		
110	114G1149-1	Valve Test Block, Shock Absorber Assembly		
111	114G1151-1	Manual Kneeling Kit, Aft Landing Gear		
112	114G1174-1	Glyd Ring Sizing Tools	A	6-78
113	114G1183-1	Container, Shipping and Storage, Rotor Blade	S/P	5-55
114	114G1185-1	Pusher, Horizontal Hinge Pin	R	5-19
115	114G1188-1	Wrench, Locknut, Power Steering		
116	114G1189-1	Puller, Relief Valve, Power Steering		
117	114G1191-1	Drift, Bearing, Power Steering Housing		
118	114G1192-1	Collar, Lower Race, Power Steering		
119	114G1193-1	Test Jig, Power Steering		
120	114G1194-1	Tester, Power Steering		
121	114G1199-1	Container, Shipping and Storage, Actuating Cylinder		
122	114G1200-1	Drift, Bearing, Aft Landing Gear		
123	114G1201-1	Drift, Bearing, Aft Landing Gear		
124	114G1202-1	Adapter, Bearing, Aft Landing Gear		
125	114G1203-1	Drift Bearing, Aft Landing Gear		
126	114G1205-2	Gage, Spline, Engine Transmission	I	6-63
127	114G1205-22	Gage, Spline, Engine Transmission	I	6-63
128	114G1206-1	Ring Assembly, Protective, Engine Inlet	S	1-51
129	114G1208-1	Test Set, Viscous Damper	AD	11-69
130	114G1213-1	Dynamic Test Fixture, Shock Absorber		
131	114G1215-1	Fixture, Soldering, Fuel Quantity Indicator		
132	114G1233-1	Locating Fixture, 90 lb Dynamic Absorber, Aft Pylon	R/IN	2-125
133	114G1236-1	Puller Assembly, Bearing, Pitch Housing	D	5-15
134	114G1238-21	Protective Cover, Cockpit	S	1-51
135	114G1262-1	Handling Fixture, Vibration Absorber	R/IN	2-53
136	114G1263-1	Swaging Tool, Pitch Link	RP	5-73
137	114G1306-1	Setting Fixture, Blade Lag Shock Absorber	AD	5-59
138	114G1322-1	Container, Blade Lag Shock Absorber	S/P	5-58
139	114G1336-1	Staking Die, Shock Absorber Assembly		
140	114G1356-1	Adapter Vibration Absorber		
141	114G1359-1	Staking Tool, Aft Engine Mount	RP	6-55
142	114G1366-1	Wrench, Shaft, Mixing Linkage, First Stage		
143	114G1373-1	Fixture, Locating, Sliding Bearing, Rotor Head Controls	A	5-89
144	114G1383-1	Kit, Test Fixture, Oil Filter, Aft Transmission		
145	114G1389-1	Kit, Test Fixture, Oil Filter		
146	114G1390-1	Adapter, Arctic Tow Bar		
147	114G1393-1	Rigging Tool, Swashplate	AD	11-27, 11-28
148	114G1396-1	Pin Wrench, Modular Filter		
149	114G1408-1	Test Harness, Self-Tuning Dynamic Absorber		
150	114G1410-1	Locating and Drill Fixture, Brackets, Sync Shaft		
151	114G1411-1	Locating and Drill Fixture, Brackets, Sync Shaft	I	2-16
152	114G1414-1	Test Harness Set, NI Actuator System		
153	114G1469-1	Adapter, Filter, Cross Shaft Vibration, Metal Blades Only	T	
153.1	114G1469-2	Adapter, Filter, Cross Shaft Metal or Fiberglass Blades	T	
153.2	145E9911-101	Sling, Handling, Rotary Wing, Metal or Fiberglass	H	5-66.3
153.3	145G1004-1	Fixture, Blade Trailing Edge Repair	RP	
153.4	146G1010-29	Fixture, Trim Tab Bending Fiberglass Blades	AD	
153.6	CS1104	Window Installation Kit	R/IN	2-36
154	PD1201	Torque Pack	R/IN	
155	PD1240	Drive Bar, Aft Rotor Shaft	R/IN	
156	PD1404	Torque Multiplier	R/IN	
157	PD1431	Reaction Adapter, Fwd Transmission	R/IN	
158	PD1432	Reaction Adapter, Aft Rotor Shaft	R/IN	
159	PD1433	Reaction Adapter Aft Transmission	R/IN	

Table 1-6. Special Tools and Test Equipment — Continued

ITEM NO	PART NO	NOMENCLATURE	USABILITY CODE	FIG REF
160	PD1454	Reaction Adapter, Rotor Blade	R/IN	
161	PD1611	Drive Bar	R/IN	
162	PD2546	Hand Crank	R/IN	
163	PD2620	Reaction Adapter, Rotor Head	R/IN	
164	PD2621	Socket	R/IN	

USABILITY CODES

R — Removal
D — Disassembly
I — Inspection
RP — Repair/Replace
T — Testing
H — Handling
A — Assembly
IN — Installation
AD — Adjustment
S — Storage
S/P — Storage/Preservation

Table 1-7. Support Equipment

AIR CHARGING EQUIPMENT

a. Air compressor MC-1A, to charge the accumulators, shock struts, tires, and to power airdriven hand tools.

b. Air chuck, used in conjunction with air compressor.

c. Air compressor, Stewart-Warner Corp. 3800219-1 or equivalent, to charge cargo hook actuating cylinder.

AUXILIARY POWER EQUIPMENT

a. Auxiliary power unit, Motor Generator Corporation 5007P or equivalent to supply ac and dc electrical power during ground operation.

b. Hydraulic teststand D5 or equivalent to supply hydraulic fluid pressure during ground operation.

c. Filter unit ADHT6814M9716M, used with hydraulic teststand to filter hydraulic fluid to an absolute 3- micron level before fluid enters helicopter hydraulic systems.

BLADE TRACKING AND BALANCING EQUIPMENT

Strobex blade tracker 135M-11
Vibrex blade balancer 177M-6A

JACKING EQUIPMENT

a. Hydraulic jack, hand-operated, A-5, MIL-J-26013, 5-ton capacity, to remove and install the forward landing gear wheels.

b. Hydraulic jack, hand-operated, A-6, MIL-J-26012, 10-ton capacity, to remove and install the aft landing gear wheels.

c. Hydraulic jack, tripod, hand-operated, 1214-151 or equivalent, 12-ton capacity, to remove any landing gear assembly and to jack the helicopter at the fuselage jack points.

TOWING EQUIPMENT

a. Tow tractor, capable of towing a gross weight of 45,000 pounds.

b. Tow bar 114G1012.

SECTION II LUBRICATION

1-46. Lubrication of the Helicopter.

Refer to fig. 1-10 and 1-11 for lubrication intervals and location of lubrication points on the helicopter. Refer to subsequent paragraphs for specific lubrication instructions.

1-47. Forward Landing Gear Lubrication. (See fig. 1-10 and 1-12.) Each forward landing gear contains three grease fittings. They are accessible from the aft end of the gear.

1-48. Aft Landing Gear Lubrication. Each aft landing gear contains a trunnion and a swivel housing that require lubrication. (See fig. 1-10.)

a. Trunnion. (See fig. 1-13.) Each aft landing gear trunnion has two grease fittings. They are located on the upper surface at both sides of the trunnion.

CAUTION

Excessive lubrication pressure at swivel fitting can damage centering cam retaining screws. If high initial pressure is required, remove fitting and check for restriction.

b. Swivel housing. (See fig. 1-14.) Each aft landing gear swivel housing has three grease fittings. One is for the swivel and two are for the drag link. Lubricate swivel fitting with a hand grease gun. Use very low pressure.

1-49. Wheel Bearings. Refer to para 3-22.

1-50. Transmission Oil Cooling Fan Lubrication. (See fig. 1-10 and 1-15.) The transmission oil cooling fan is lubricated thru an external grease fitting on the left side of the aft pylon. Pump four to six full strokes with grease gun. The bearings are behind the fan. It is not possible to see excess grease being pushed out.

1-51. Synchronizing Shaft Bearing Lubrication. (See fig. 1-10, 1-16, and 1-17.) The forward and aft synchronizing shafts have a lubrication fitting at each carrier bearing. The bearings are located at the couplings of the synchronizing shaft segments. There are six fittings on the forward shaft and one fitting on the aft shaft.

1-52. Lubrication of Engine Condition Control Panel 114ES217-5. (See fig. 1-10 and 1-18.) Lubricate the lever shaft and the support shaft with a thin coat of grease (C162) or (C163) at 500-hour intervals as follows:

a. Remove the control from the console. (Refer to para 4-318.)

b. Loosen the two fasteners and remove the dust cover from the control.

c. Apply a thin coat of grease to the lever shaft and the support shaft, using a small bristle brush. Move the levers to all positions to ensure coating the entire shaft.

d. Reinstall the dust cover and tighten the fasteners.

e. Reinstall the control in the console. (Refer to para 4-322.)

1-53. Controllable Swashplate Purging. (See fig. 1-11 and 1-19.) Purge the controllable swashplates with grease (C163) after each 100 hours of opertion as follows:

CAUTION

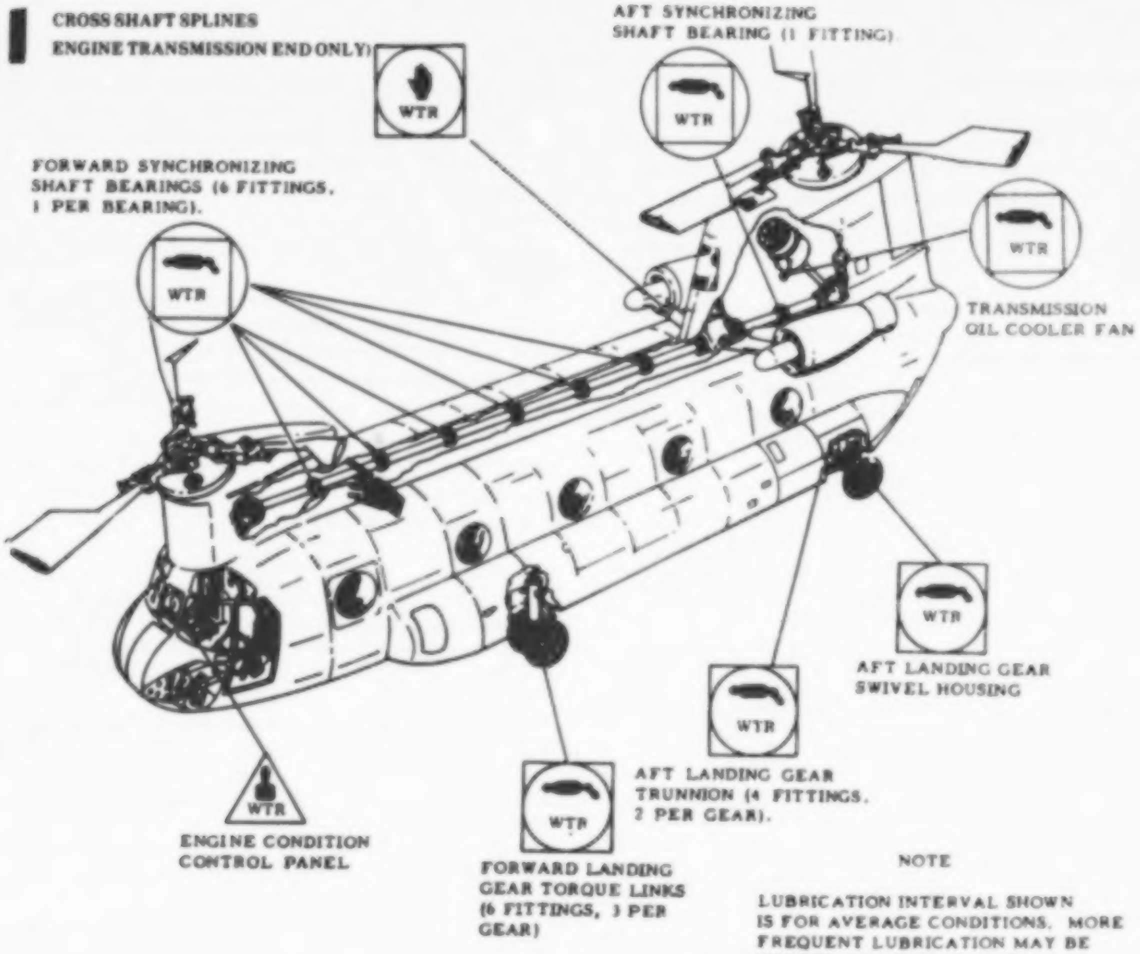
Do not let grease enter between the swashplate and slider assemblies. Grease in this area will result in contamination and deterioration of the teflon bearing sleeve. Use a cloth (C104) to wipe purged grease from the vent opening.

a. Wipe off grease and dirt from the vent and lube fitting area. Pump grease (See fig. 1-19) into the grease fitting on the underside of the stationary swashplate ring. While purging, turn the rotating swashplate continuously a minimum of 360°. If simultaneous turning and purging is not possible, reposition the swashplate a minimum of 12 times in 30° increments. Purging may be interrupted while the swashplate is being repositioned.

b. Continue purging until a full fillet (bead) of grease, at least 75 percent clean, appears around the entire parting line (360°) between upper seals.

c. Remove excess grease from around the grease fitting and between swashplate upper seals.

d. Check purged grease for metallic particles, both visually and by feeling the grease. If particles are present, replace the swashplate. (Refer to para 5-168 and 5-193.)


CROSS SHAFT SPLINES
ENGINE TRANSMISSION END ONLY)
WTR
AFT SYNCHRONIZING SHAFT BEARING (1 FITTING)
WTR
FORWARD SYNCHRONIZING SHAFT BEARINGS (6 FITTINGS, 1 PER BEARING).
WTR
WTR
TRANSMISSION OIL COOLER FAN
WTR
AFT LANDING GEAR SWIVEL HOUSING
WTR
AFT LANDING GEAR TRUNNION (4 FITTINGS, 2 PER GEAR).
WTR
ENGINE CONDITION CONTROL PANEL
WTR
FORWARD LANDING GEAR TORQUE LINKS (6 FITTINGS, 3 PER GEAR)

NOTE

LUBRICATION INTERVAL SHOWN IS FOR AVERAGE CONDITIONS. MORE FREQUENT LUBRICATION MAY BE NECESSARY UNDER EXTREMELY DUSTY CONDITIONS.

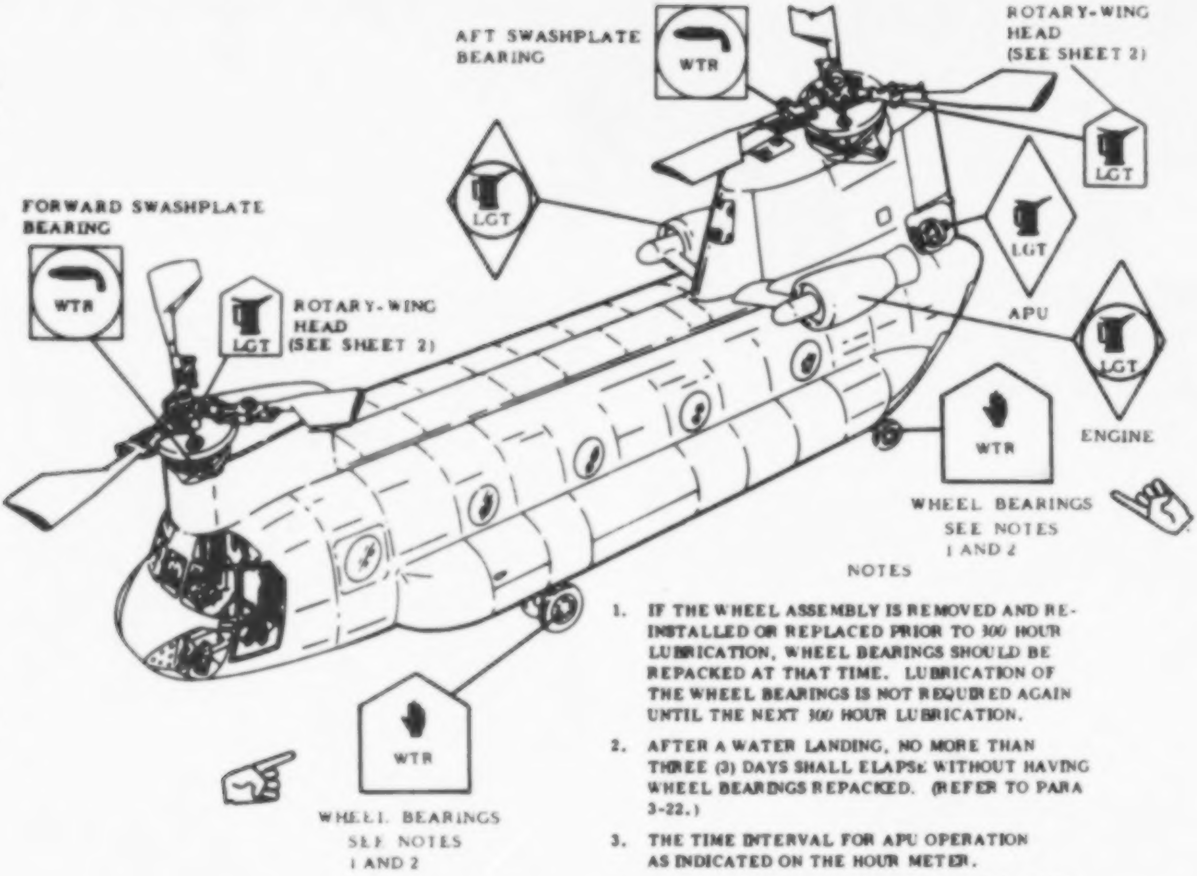
TABLE OF LUBRICANTS		
IDENTI-FICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT
WTR	MIL-G-81322B (C164)	GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE

SYMBOLS	FREQUENCY	METHOD OF APPLICATION
○□	25 HOURS	
□○	100 HOURS	GREASE GUN
△	500 HOURS	
		BRUSH
		HAND

42-53

Figure 1-10. Lubrication Chart

8116-472-200


AFT SWASHPLATE BEARING
WTR
ROTARY-WING HEAD (SEE SHEET 2)
LGT
FORWARD SWASHPLATE BEARING
WTR
ROTARY-WING HEAD (SEE SHEET 2)
LGT
LGT
LGT
APU
LGT
ENGINE
WTR
WHEEL BEARINGS SEE NOTES 1 AND 2
WTR
WHEEL BEARINGS SEE NOTES 1 AND 2

NOTES

1. IF THE WHEEL ASSEMBLY IS REMOVED AND REINSTALLED OR REPLACED PRIOR TO 300 HOUR LUBRICATION, WHEEL BEARINGS SHOULD BE REPACKED AT THAT TIME. LUBRICATION OF THE WHEEL BEARINGS IS NOT REQUIRED AGAIN UNTIL THE NEXT 300 HOUR LUBRICATION.
2. AFTER A WATER LANDING, NO MORE THAN THREE (3) DAYS SHALL ELAPSE WITHOUT HAVING WHEEL BEARINGS REPACKED. (REFER TO PARA 3-22.)
3. THE TIME INTERVAL FOR APU OPERATION AS INDICATED ON THE HOUR METER.
4. REFER TO SERVICING INSTRUCTIONS FOR USAGE LIMITATIONS. USE MIL-L-7808 (C226) ONLY IN ROTARY-WING HEADS.

TABLE OF LUBRICANTS		
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT
LGT	MIL-L-7808 (C226) OR MIL-L-23699 (C225) (SEE NOTE 4)	LUBRICATING OIL, AIRCRAFT TURBINE ENGINE SYNTHETIC BASE
WTR	MIL-G-81322 (C163)	GREASE, AIRCRAFT, GENERAL PURPOSE, WIDE TEMPERATURE RANGE

SYMBOL	FREQUENCY
◇	12 MONTHS
□	100 HOURS
◇	400 HOURS OR 24 MONTHS
⬠	300 HOURS

METHOD OF APPLICATION
GREASE GUN
HAND
OIL CAN

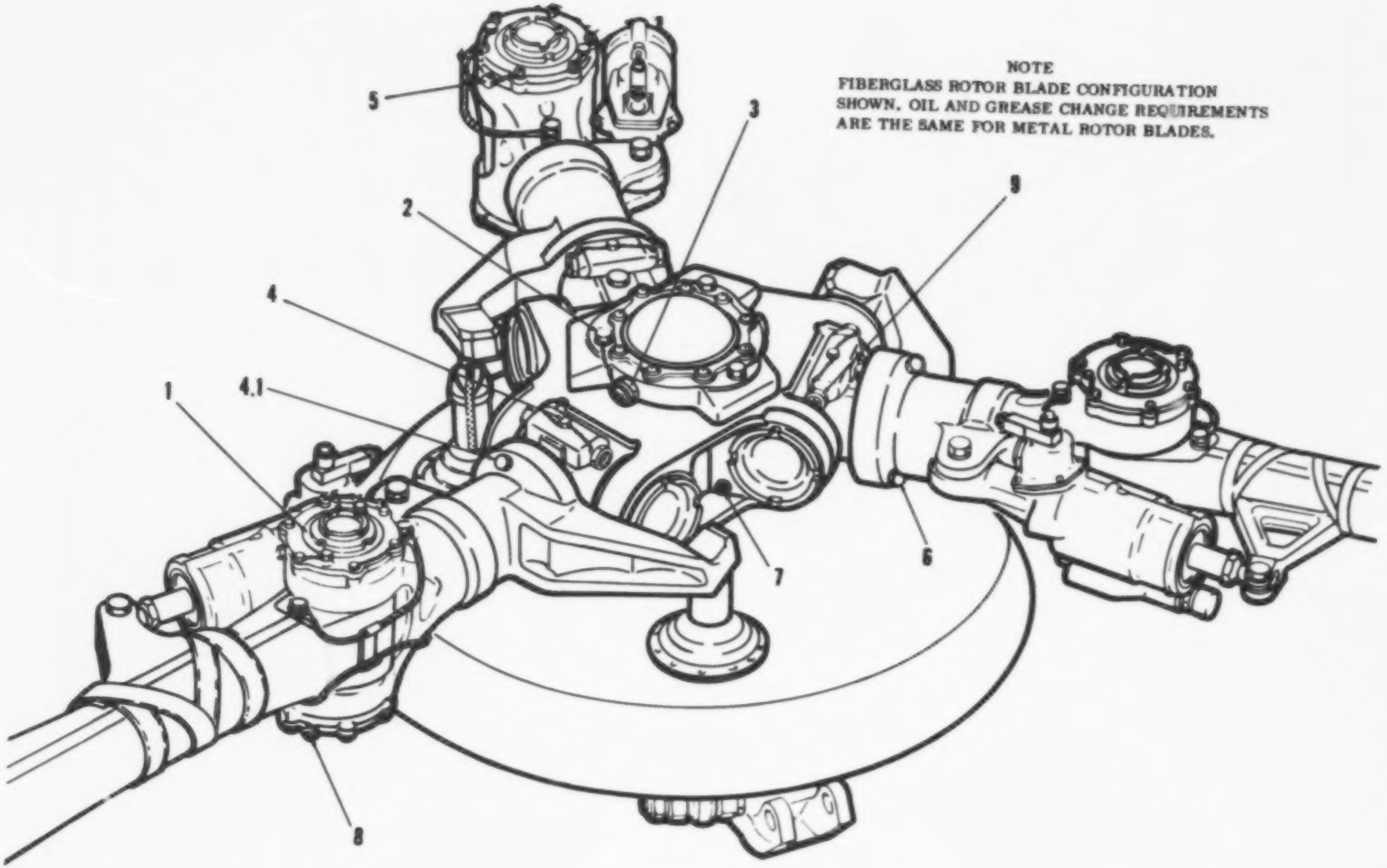
42 x 52

B1144/3 20V

Figure 1-11. Oil and Grease Change Requirements (Sheet 1 of 2)

NOTE

FIBERGLASS ROTOR BLADE CONFIGURATION SHOWN. OIL AND GREASE CHANGE REQUIREMENTS ARE THE SAME FOR METAL ROTOR BLADES.



1. Vertical hinge pin bearing filler plug (2 per pin)
2. Hub oil tank filler plug (3 per tank)
3. Hub oil tank sight gage (3 per tank)
4. Pitch-varying housing oil tank filler plug (1 per housing)
4.1 Vent plug (1 per housing)
5. Vertical hinge pin bearing oil tank sight gage (2 per pin)
6. Pitch-varying housing oil tank drain plug
7. Hub oil tank drain plug
8. Vertical hinge pin bearing oil tank drain plug
9. Pitch-varying housing oil tank sight gage (2 per housing.)

Figure 1-11. Oil and Grease Change Requirements (Sheet 2 of 2)

Page 1-34.1 Deleted.

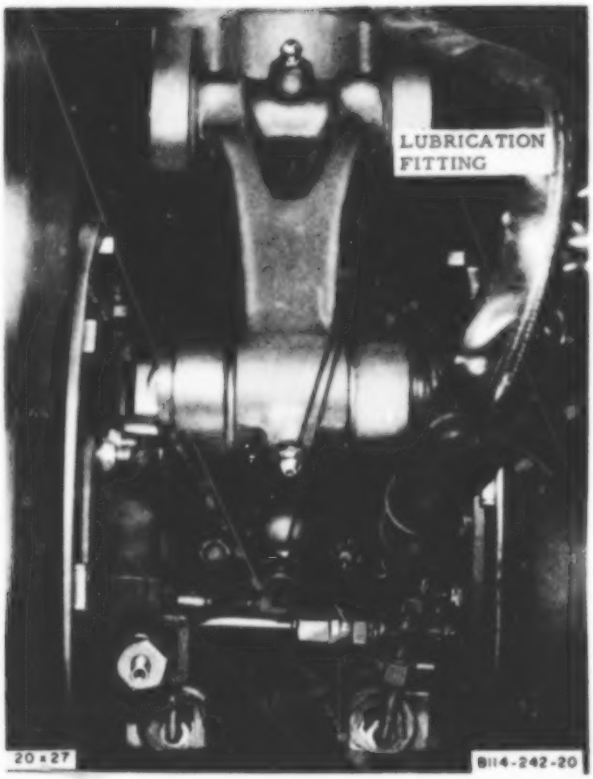

LUBRICATION FITTING
20 x 27
BII4-242-20

Figure 1-12. Forward Landing Gear Lubrication Fittings

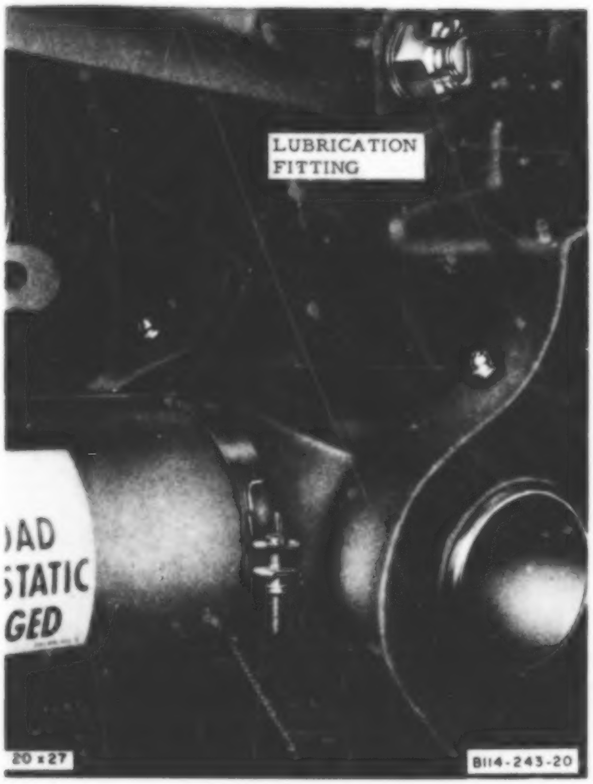

LUBRICATION FITTING
)AD
STATIC
GED
20 x 27
BII4-243-20

Figure 1-13. Aft Landing Gear Trunnion Lubrication Fittings

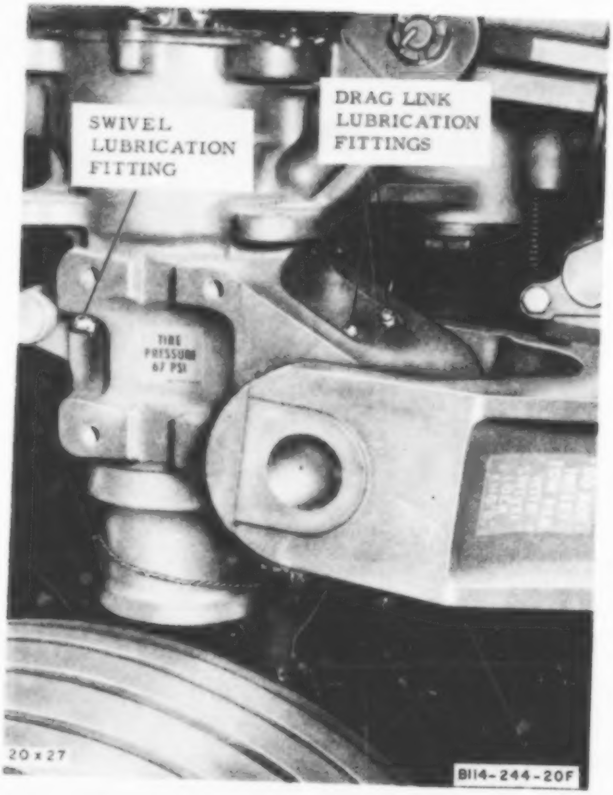

SWIVEL LUBRICATION FITTING
DRAG LINK LUBRICATION FITTINGS
TIRE PRESSURE 67 PSI
20 x 27
BII4-244-20F

Figure 1-14. Aft Landing Gear Swivel Housing Lubrication Fittings

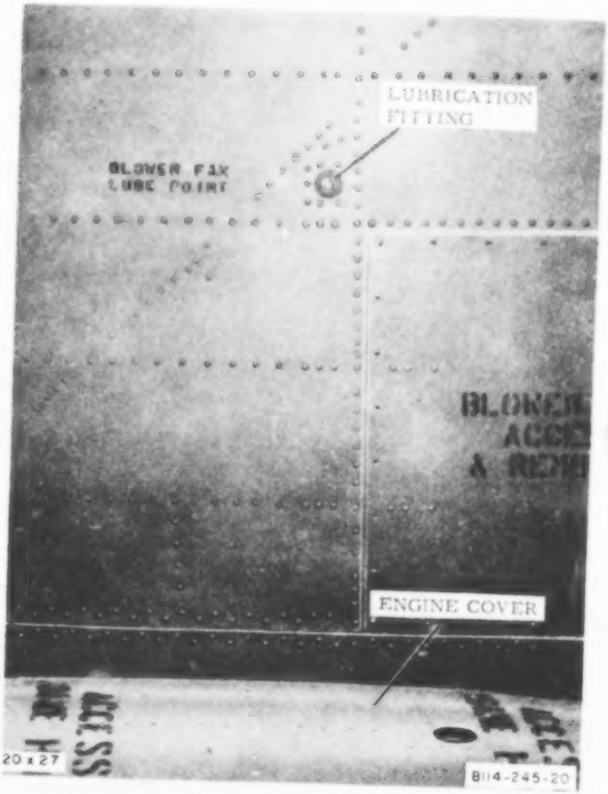

LUBRICATION FITTING
BLOWER FAN LUBE POINT
ENGINE COVER
20 x 27
BII4-245-20

Figure 1-15. Transmission Oil Cooling Fan Lubrication Fitting

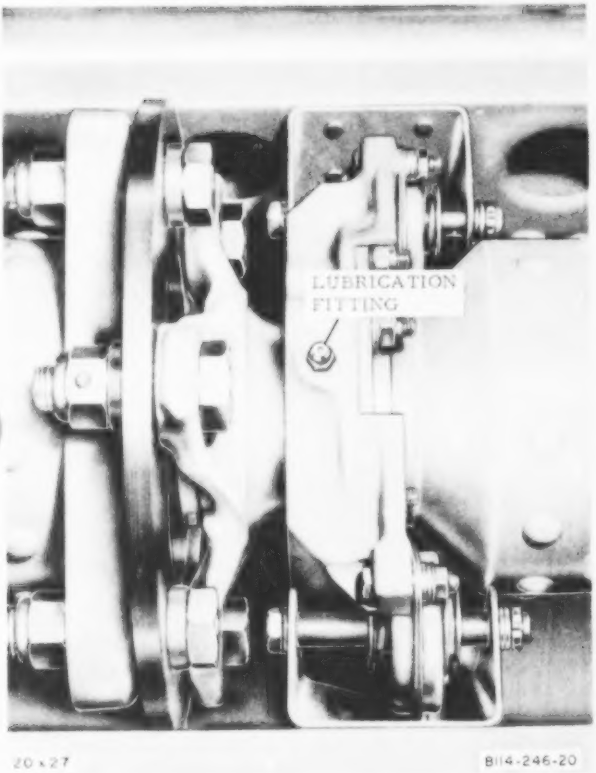

LUBRICATION FITTING
20 x 27
B114-246-20

Figure 1-16. Forward Synchronizing Shaft Bearing Lubrication Fitting

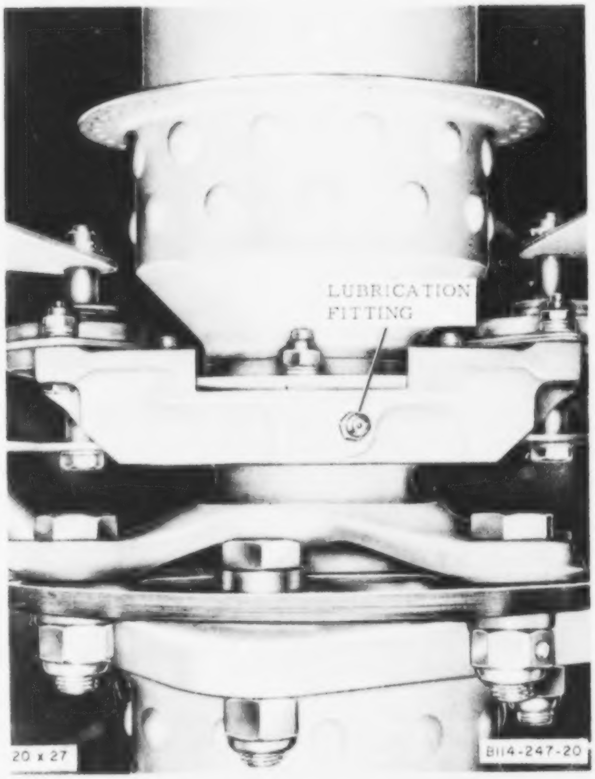

LUBRICATION FITTING
20 x 27
B114-247-20

Figure 1-17. Aft Synchronizing Shaft Bearing Lubrication Fitting

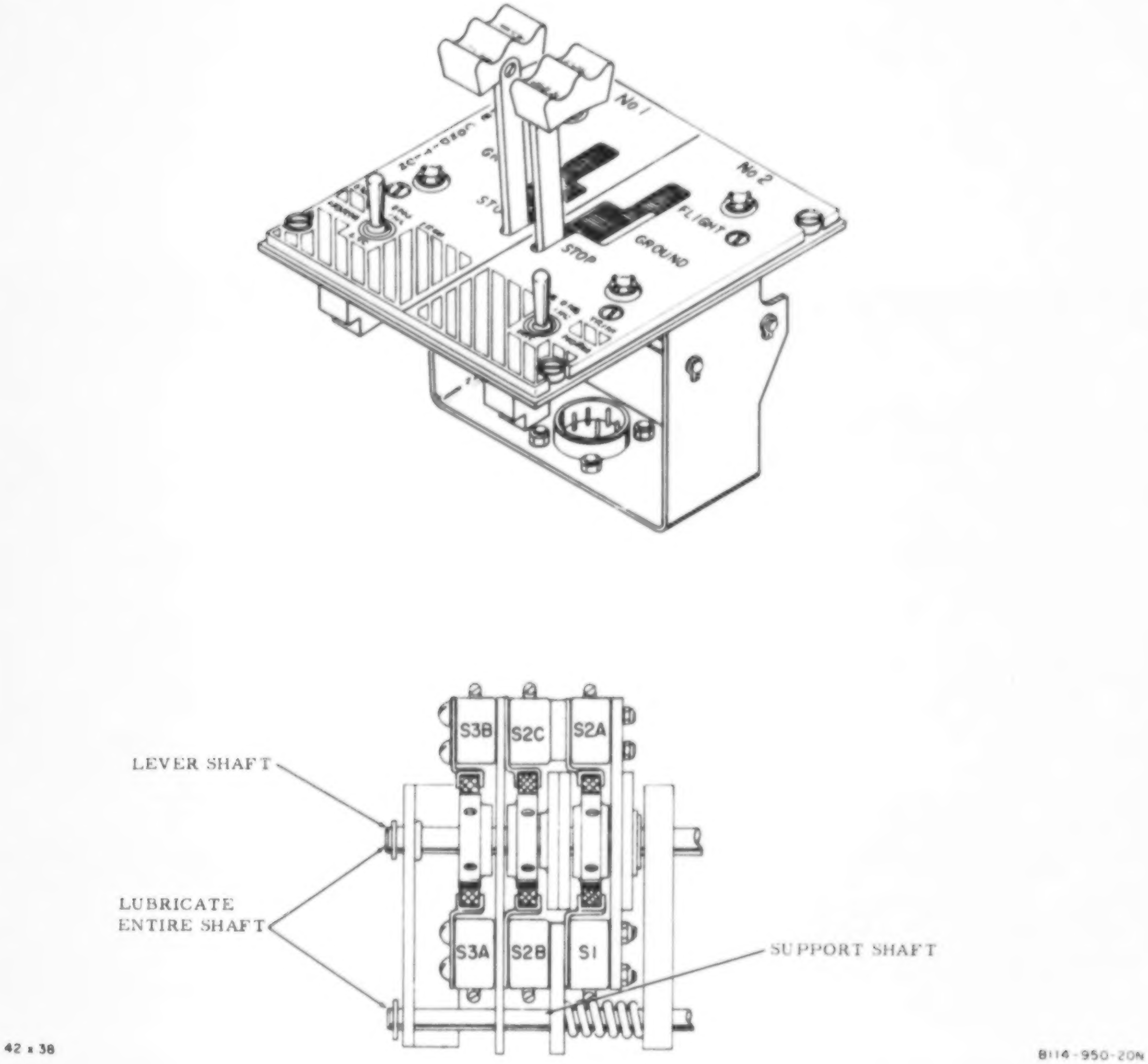

No 1
No 2
FLIGHT
GROUND
STOP
S3B
S2C
S2A
S3A
S2B
S1
LEVER SHAFT
LUBRICATE ENTIRE SHAFT
SUPPORT SHAFT
42 x 38
B114-950-20N

Figure 1-18. Lubrication of Engine Condition Control Panel 114ES217-5

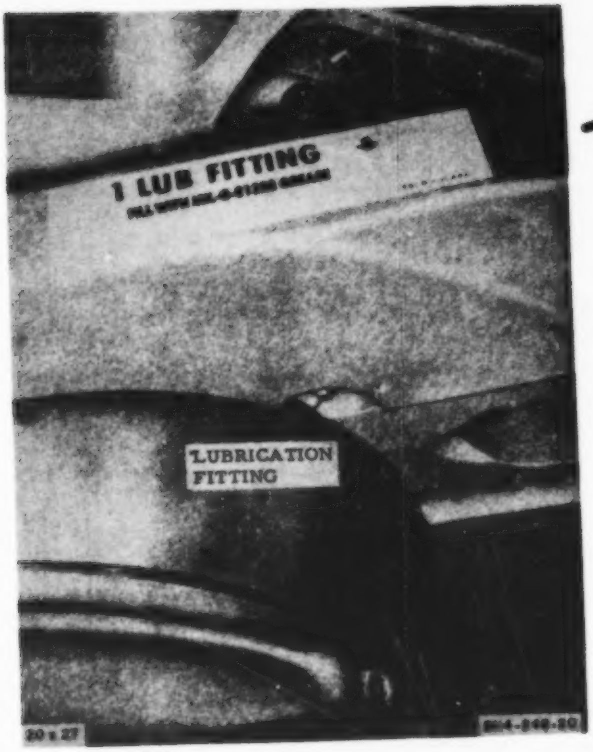


Figure 1-19. Swashplate Lubrication Fitting

SECTION III GROUND HANDLING

1-54. Aircraft Dimensions and Details.

Primary fuselage station locations of the helicopter are shown in fig. 1-20. Station numbers in inches are marked in four places on the aft side of cabin frames. Waterline 0.0 is marked at each side of the cabin along a beam below the windows. An exploded view of the helicopter, showing propulsion and power trains, apu, landing gear, and fuel tanks, is shown in fig. 1-21.

1-55. Environmental Maintenance.

Environmental conditions affect helicopter maintenance in various ways. Dust and sand can penetrate cracks and crevices and cause electronic and mechanical equipment failure or malfunction. Direct exposure to sun and intense heat can cause rubber and synthetic materials to crack and deteriorate, coated fabrics to become brittle, and operating engines and other equipment to overheat. Moisture resulting from precipitation or condensation can cause corrosion (rusting) of metal parts, malfunction of electronic equipment because of fungus growth, and rotting of fabrics from mildew. Salt water or spray is even more corrosive to metal parts and materials. Extreme cold or hot climatic conditions require more frequent inspection and lubrication intervals with strict adherence to use of proper lubricants.

1-56. Hot Weather Maintenance. Refer to TM 55-1500-204-25/1 and TM 55-410 for hot weather maintenance procedures.

CAUTION

To prevent distortion of plastic enclosures, sliding windows shall be opened to permit air circulation thru helicopter when parked in direct sun or where extremely hot climatic conditions prevail.

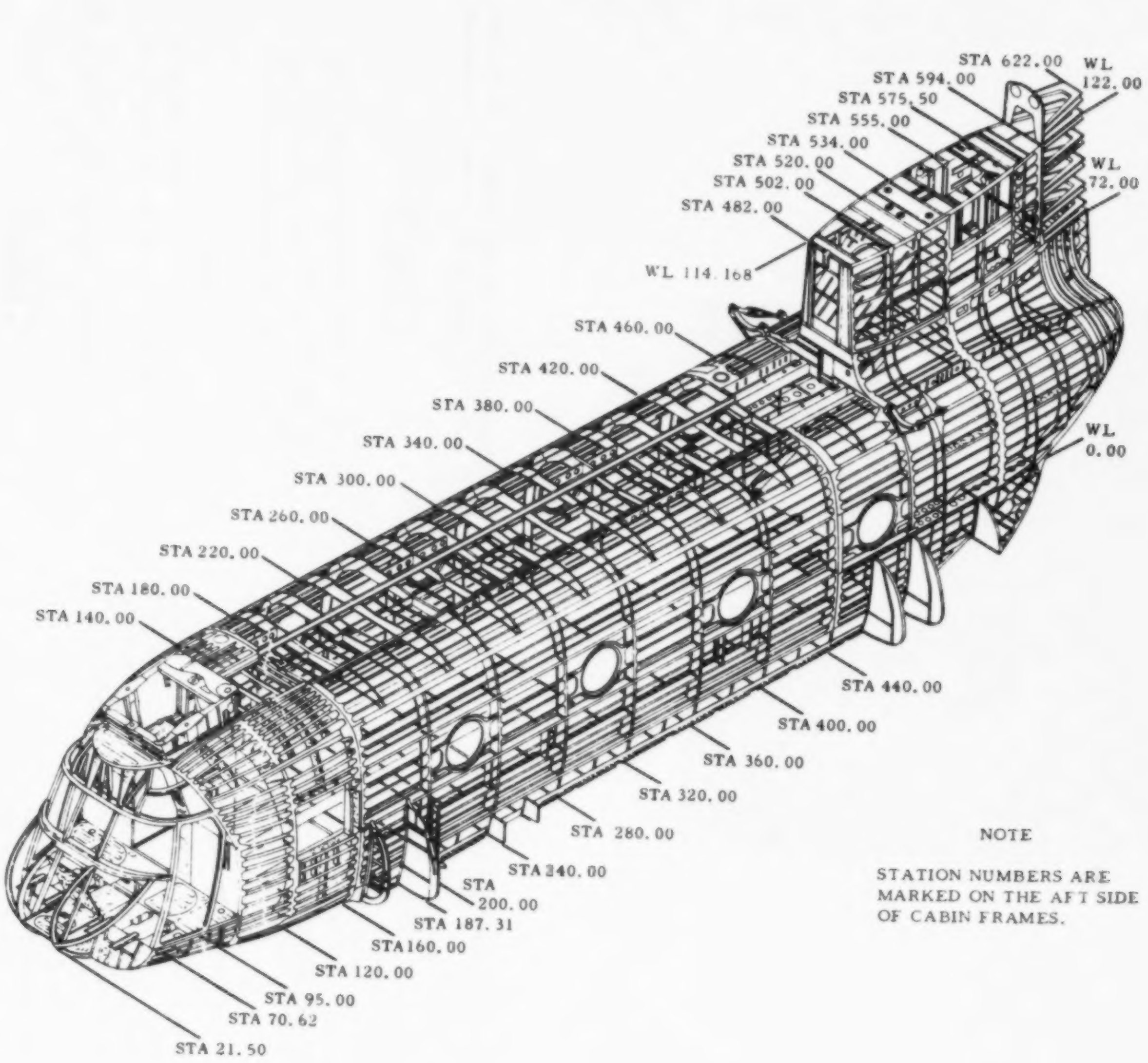
NOTE

Extremely high humidity can exist within a closed helicopter even when outside humidity is low.

1-57. Dust Environment Maintenance. Perform the following operations in extremely dusty areas.

CAUTION

A clean rag (C104) moistened in solvent (C136) may be used to remove solid deposits from flight control components, however, do not saturate the cloth with solvent. Excess solvent will contaminate the bearings.


STA 622.00
WL 122.00
STA 594.00
STA 575.50
STA 555.00
STA 534.00
WL 72.00
STA 520.00
STA 502.00
STA 482.00
WL 114.168
STA 460.00
STA 420.00
STA 380.00
WL 0.00
STA 340.00
STA 300.00
STA 260.00
STA 220.00
STA 180.00
STA 140.00
STA 440.00
STA 400.00
STA 360.00
STA 320.00
STA 280.00
STA 240.00
STA 200.00
STA 187.31
STA 160.00
STA 120.00
STA 95.00
STA 70.62
STA 21.50
54X39
BIM-229-20U

NOTE

STATION NUMBERS ARE MARKED ON THE AFT SIDE OF CABIN FRAMES.

Figure 1-20. Fuselage Stations, Waterlines, and Buttlines (Sheet 1 of 2)

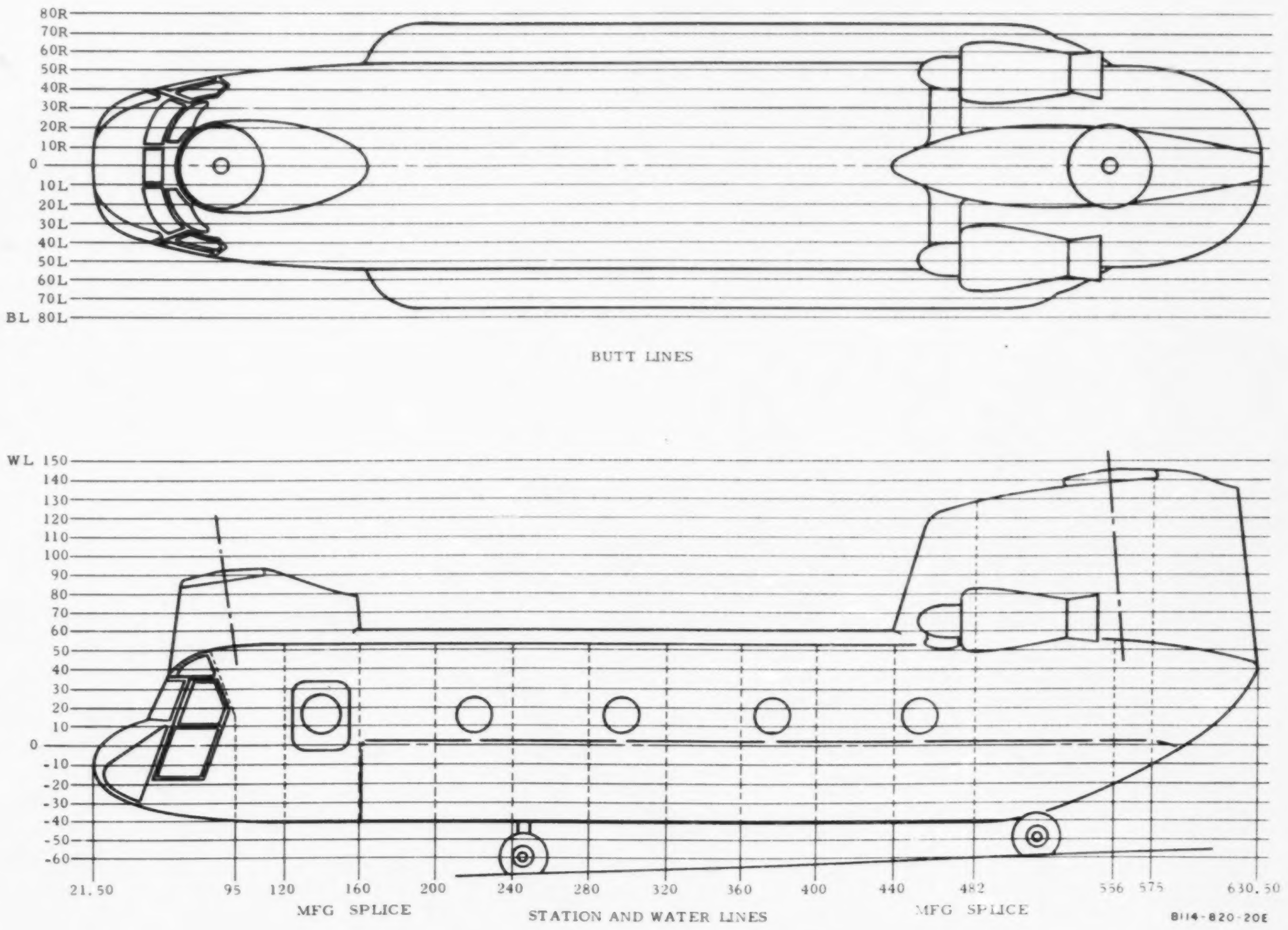
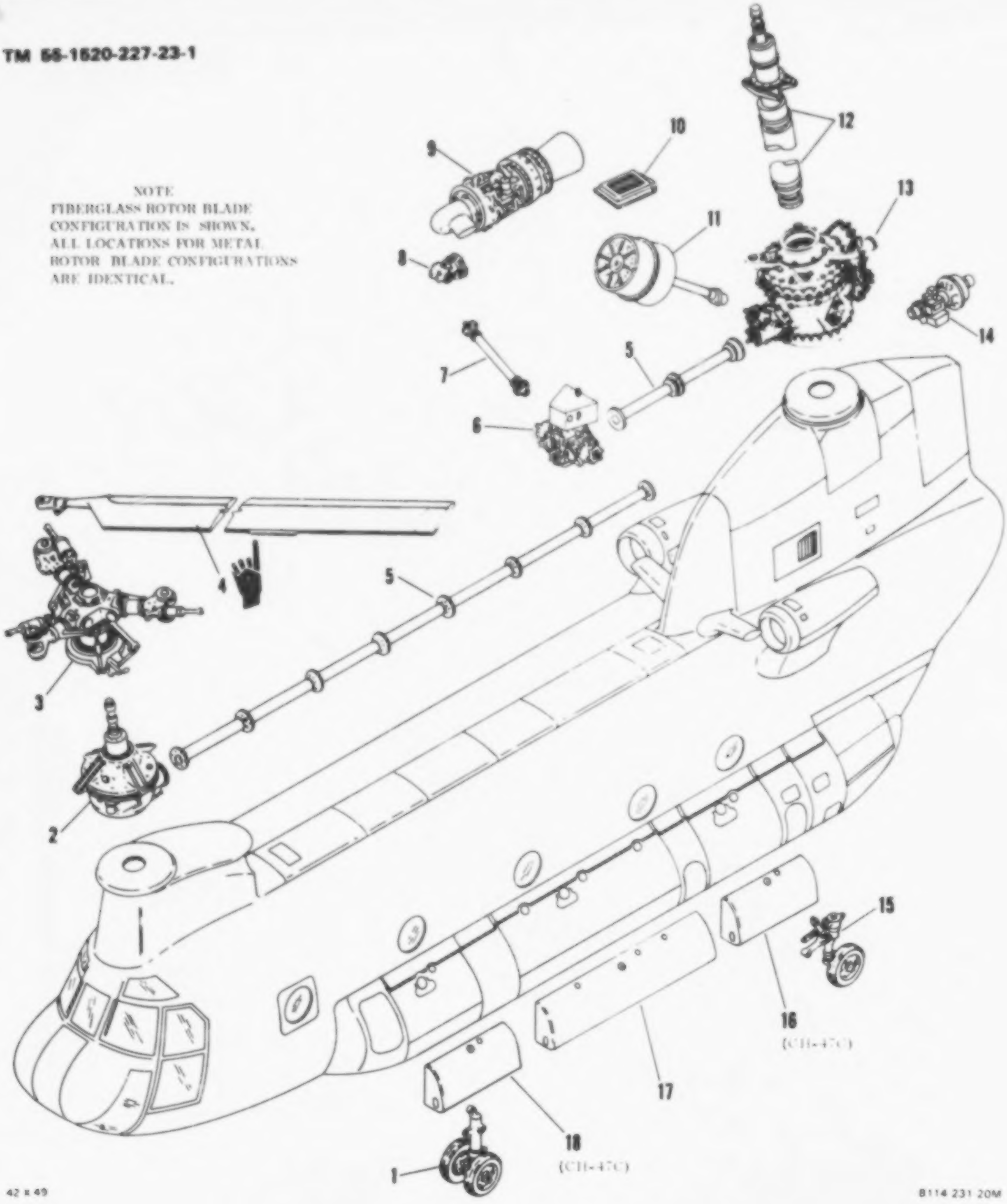

80R
70R
60R
50R
40R
30R
20R
10R
0
10L
20L
30L
40L
50L
60L
70L
BL 80L
BUTT LINES
WL 150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
21.50
95
120
160
200
240
280
320
360
400
440
482
556
575
630.50
MFG SPLICE
STATION AND WATER LINES
MFG SPLICE
B114-820-20E

Figure 1-20. Fuselage Stations, Waterlines, and Buttlines (Sheet 2 of 2)



NOTE
FIBERGLASS ROTOR BLADE CONFIGURATION IS SHOWN. ALL LOCATIONS FOR METAL ROTOR BLADE CONFIGURATIONS ARE IDENTICAL.

42 x 49

8114 231 20M

1. Forward landing gear
2. Forward transmission
3. Rotary-wing head
4. Rotary-wing blade
5. Drive shafts
6. Engine combining transmission
7. Engine drive shaft
8. Engine transmission
9. Powerplant
10. Transmission oil cooler
11. Transmission oil cooler fan and drive
12. Aft rotary-wing drive shaft
13. Aft transmission
14. Auxiliary power unit
15. Aft landing gear
16. Aft auxiliary fuel tank
17. Main fuel tank
18. Forward auxiliary fuel tank

Figure 1-21. Exploded View of Helicopter

a. (See fig. 1-22.) Clean the flight control linkage in the driveshaft tunnel area as required. Use a dry brush, low pressure compressed air or if necessary a cloth (C104) damp with solvent (C136). Remove dirt, sand, and grit from bellcrank, idler, and connecting link bearing area.

b. Clean the interior of the engine condition control panel 114ES217-5 as required. Proceed as follows:

(1) Remove the panel from the console. (Refer to para 4-318.)

(2) Loosen two fasteners. Remove the box cover from the control.

(3) Remove all dust and dirt from the interior of the box cover. Remove all dust and dirt from internal parts of the control. Pay particular attention to switches, cams, springs, bearing areas, and pivot points. Use a soft bristle brush or low pressure compressed air.

(4) Apply a thin coat of grease (C162) or (C163) to the lever and support shafts, using a small bristle brush. Move the levers to all positions to ensure coating the entire shafts.

(5) Install the box cover and tighten the fasteners.

(6) Install the control panel in the console. (Refer to para 4-314.)

CAUTION

A clean rag (C104) moistened in solvent (C136) may be used to remove solid deposits from flight control components, however, do not saturate the cloth with solvent. Excess solvent will contaminate the bearings.

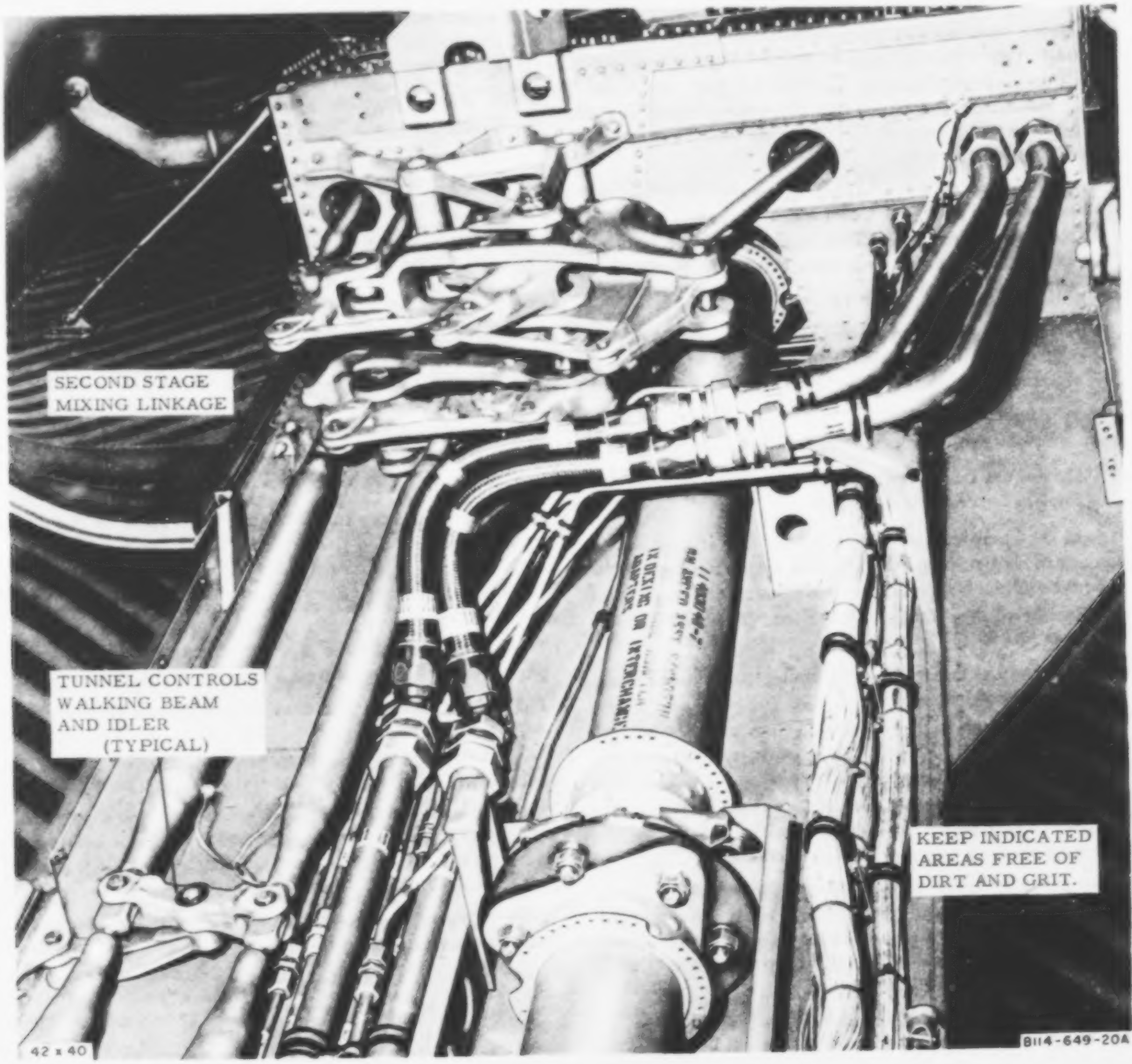

SECOND STAGE MIXING LINKAGE
TUNNEL CONTROLS WALKING BEAM AND IDLER (TYPICAL)
KEEP INDICATED AREAS FREE OF DIRT AND GRIT.
42 x 40
B114-649-20A

Figure 1-22. Flight Control Linkage Cleaning

c. Clean swashplate in the area of the slider shaft. Use a dry brush, low pressure compressed air or, if necessary, a cloth damp with solvent (C136).

1-58. Cold Weather Maintenance. Refer to TM 55-1500-204-25/1, TM 55-410, and to para 1-59 thru 1-67 for cold weather maintenance information.

1-59. Engines. Observe the following precautions when starting the engines in cold weather.

CAUTION

Do not operate engines when blades are folded. Damage to rotor system will result. Do not operate apu when blades are folded unless pitch links have been removed. Pressurizing flight control hydraulic system with blades folded and pitch links installed will damage pitch links, swashplates, and heads.

a. Before starting engines, remove snow and ice from the air inlet housing and from the area forward of housing.

b. If bypass inlet screens 114P8073-1 and -2 are installed, remove the two screen panels from the bypass openings aft of the main screen. These bypass panels are not to be used below 40°F (4°C).

c. Standard inlet screens 114P8015-1 and -2 are not to be used below 40°F (4°C).

d. Remove the top half of the screen. (Refer to para 4-174.) Determine that the compressor rotor turns freely.

NOTE

As engine cools to an ambient temperature below 32°F (0°C) after engine shutdown, condensed moisture will freeze the engine parts.

CAUTION

Do not use starter to free a frozen compressor rotor. Engine damage can result.

e. If the compressor rotor is frozen, free it by ducting hot air thru air inlet housing. Obtain hot air from an external source.

f. Install the top half of the screen. (Refer to para 4-182.)

1-60. Battery. Observe the following precautions with the battery in cold weather.

a. If helicopter is to be parked overnight in ambient temperatures of -40°F (-40°C) or below, remove battery. Store it in a warm place until ready for use.

b. During all helicopter operations at low temperatures, conserve battery power by keeping electrical loads (lights, etc.) at an absolute minimum, before starting apu.

1-61. Landing Gear Shock Struts. Wipe off exposed shafts of landing gear shock struts daily during cold weather. This prevents accumulation of ice and dirt which could damage seals and packings. Use clean cloths (C104) dampened with hydraulic fluid (C175).

1-62. Rotary-Wing Blade Shock Absorbers. (See fig. 1-23.) Shock absorbers 114H6800-3 and -5 have a manually controlled vent valve. The valve must be open in temperatures below 0°F (-17.8°C). The valve must be closed in temperatures above 30°F (-1.1°C). Open or close the valve as follows:

WARNING

The vent valve on shock absorbers 114H6800-3 and -5 shall be open when temperature is below 0°F. Otherwise, dangerous ground and flight reactions can occur. Shock absorbers 114H6800-2 and -4 shall not be used when temperature is below 0°F.

NOTE

The vent valve may be open or closed at ambient temperatures between 0° and 30°F.

a. Remove the lockwire and loosen the locknut.

b. Turn the adjustment screw fully clockwise to close valve. Back it off ½-turn from closed to open the valve.

c. TORQUE THE LOCKNUT TO 20 TO 30 POUND-INCHES AND LOCKWIRE IT. USE LOCKWIRE (C206).

1-63. Flight Control System. Observe the following precautions with the flight control system in cold weather.

a. Wipe off the exposed shafts of the flight control actuating cylinders daily. This prevents accumulation of ice and dirt which could damage seals and packing. Use clean cloths dampened with hydraulic fluid (C176).

CAUTION

Two types of linear variable differential transformers (lvdt) are used on the dual extensible links. At 0°F (-18°C) and below, only one of the two types can be used on the helicopter. One type has a housing about 4⅛ inches long. The other type has a housing about 4¾ inches long. Use the 4⅛ inch long lvdt at 0°F and below.

b. Check that the correct lvdt are installed on the dual extensible links. Do this by measuring the length of the lvdt housing. The correct length should be about 4⅛ inches. If it is about 4¾ inches, replace the lvdt with one of the correct length.

1-64. Utility Hydraulic System Accumulator. Refer to para 1-16 for cold weather maintenance procedures.

1-65. Windshield. Observe the following precautions during cold weather.

a. Do not scrape ice or frost from windshields. Scratches will result.

b. Before operation of the windshield wiper blades, use windshield heating to soften ice and frost. Prior heating of the windshield will prevent windshield scratches and wiper blade damage.

1-66. Ice and Snow on Exterior Surfaces. Maintain exterior surfaces as follows:

CAUTION

Do not chip or scrape ice or frost from any helicopter surface. Damage will result.

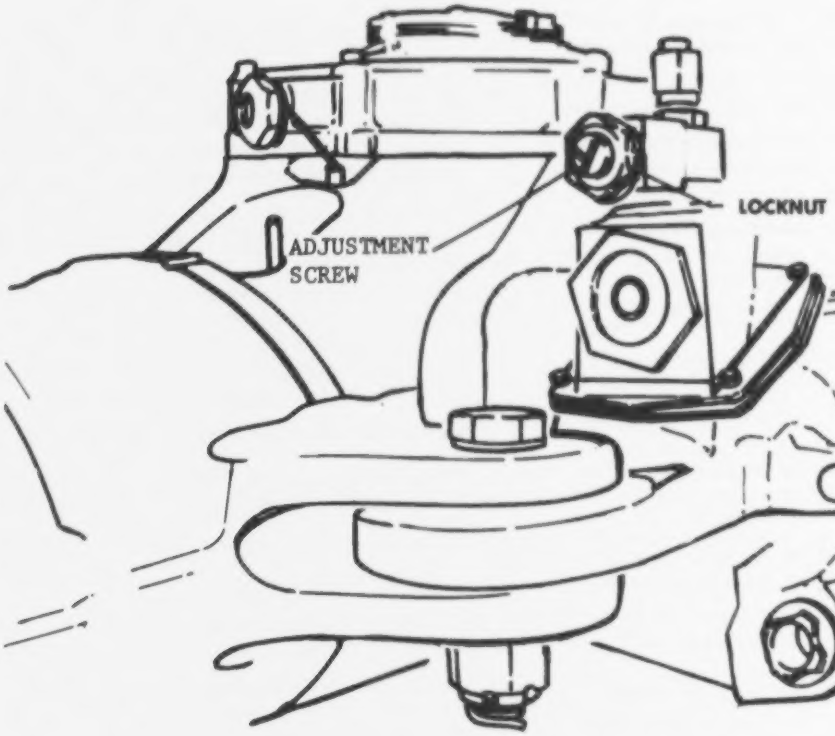


Figure 1-23. Shock Absorber 114H6800-3 and -5 Vent Valve

a. Before flight, brush all loose snow or frost from helicopter exterior surfaces, particularly rotor blades.

CAUTION

Do not use benzene, toluene, acetone, methyl-ethyl-ketone, ethyl acetate, lacquer thinner, or strong alkaline solutions on the cover of the ISIS indicator on the rotor blades. Damage to the plastic indicator will result.

b. On helicopters with metal rotor blades, clean snow or ice from the ISIS indicator. Use isopropyl alcohol (C54), or anti-icing and deicing-defrosting fluid (C60). Deicing-defrosting fluid (C60) should be mixed in accordance with the following solutions to preclude paint removal on the Fiberglass Rotor Blade.

TEMPERATURE (DEGREES FAHRENHEIT)	PERCENT MIX	PERCENT WATER
Down to Plus 30 degrees	20 percent	80 percent
From Plus 20 to Plus 29 degrees	30 percent	70 percent
From Plus 10 to Plus 19 degrees	40 percent	60 percent
From 0 to Plus 9 degrees	45 percent	55 percent
From Minus 10 to Minus 1 degree	50 percent	50 percent
From Minus 20 to Minus 11 degrees	55 percent	45 percent
From Minus 30 to Minus 21 degrees	60 percent	40 percent

NOTE

The 60/40 degree mixture is the maximum strength authorized. Preheating of the mixture to 150 degrees will enhance the ice removal qualities.

c. Remove any remaining ice by spraying or brushing on a coat of anti-icing and deicing-defrosting fluid (C60). Work from upper surfaces downward to prevent an accumulation of ice on previously cleared surfaces. (C60) may be used on Fiberglass Rotary Wing Blades.

d. Maintain door latches and handle release mechanisms in operable condition in temperatures to -65°F (-54°C). Apply a coating of release agent (C272) to the surfaces of the handle latch button and mechanism, handle shaft and spring, and handle recess in latch body. Before applying this coating, clean all surfaces with solvent (C137) to remove all grease. No other lubricant is required and none should be used on the coated surfaces. The coating shall be renewed at intervals as determined by reduction in efficiency.

1-67. Cleaning of Transparent Plastic. When cleaning transparent plastic at below freezing temperatures, cleaning and polishing compound (C103) or (C251), shall be used in place of water to prevent ice formation. All other cleaning procedures and precautions set forth in para 1-26 and 1-27 shall be followed.

1-68. Rotary-Wing Blade Handling.

Metal blades 114R1502 series can be folded in one of two configurations for storage, shipment, or wind protection.

NOTE

There are no blade folding procedures for CH-47C helicopters fitted with fiberglass rotary-wing blades. For storage, shipment, or wind protection, they must be removed. (Refer to para 5-132.13.)

1-69. Blade Folding (Metal Blades). (See fig. 1-24 and 1-25.)

a. Open work platforms on both sides of forward and aft pylons.

b. Attach a blade tiedown rope to forward right and the aft left blade nearest fuselage centerline.

CAUTION

Use care in handling the flap restrainer. If dropped, it can damage rotary-wing head components.

c. Install flap restrainer (T98) on the forward rotary-wing head by performing steps (1) thru (3). Install flap restrainer 114E5044-17 on the forward rotary-wing head by performing steps (4) and (5).

NOTE

Use only flap restrainer (T98) on the aft head. Any flap restrainer may be used on the forward head.

(1) Place flap restrainers (5, fig. 1-24) over the horizontal hinge pins of the two forward rotary-wing blades which do not have a tiedown rope installed. Make sure the hand knob is on the same side of the blade as the shock absorber.

(2) Tighten the hand knob at the side of the flap restrainer until the assembly is secure.

(3) Tighten the screw assembly at the top of the flap restrainer until the stop block is tight against the pitch-varying housing stops (part of housing).

(4) Place flap restrainer (2, fig. 1-24) on the forward rotary-wing head. The beveled edges of the restrainer shall be parallel to the horizontal hinge pin.

WARNING

Make sure that hookbolts are seated and the flap restrainer is sitting flat before you torque restraining nuts. Otherwise the flap restrainer may work loose, causing partial flapping. This can result in personnel injury or equipment damage.

CAUTION

Do not overtorque hookbolts. Equipment damage can result. Be careful when handling the flap restrainer. If you drop it, it can damage rotary-wing head components.

(5) Position pins (8) on the hookbolts in the holes on the underside of hub. TORQUE THE NUTS TO 396 to 444 POUND-INCHES.

d. Install flap restrainers (5) on the aft rotary-wing head. Refer to step c.(1) thru (3).

NOTE

Use only flap restrainer (T98) on the aft head.

e. Install blade lead-lag rigging tool (9 or 10) on rotary-wing blades which have tiedown ropes attached.

NOTE

The rigging tool cannot be installed unless the shock absorber is at its center of travel. The shock absorber can be extended or retracted by restraining hub rotation and moving the blade in which the rigging tool is to be installed.

f. Manually rotate the rotary-wing system until blades with tiedown ropes installed are about 3 feet from the side of the fuselage. Then install rack assembly (6) as follows:

(1) Remove the two top outboard cradles from the rack assembly.

(2) Position the rack assembly on the top of fuselage with the wide base section opposite the crown walkway.

(3) Install the rack assembly into fuselage fittings at sta 317. Make sure that two lockpins are locked into fuselage fittings before releasing rack assembly.

g. Pull forward blade into rack assembly. Use the installed tiedown rope. Place blade in cradle. Secure blade with cradle strap (3). Adjust the rack assembly in the fuselage fittings. Remove the tiedown rope.

h. Open the aft pylon leading edge hinged fairing. Raise lower section of fairing for access to the rotary-wing phasing mechanism.

i. Dephase the rotary-wing system. (Refer to para 6-1.1).

CAUTION

If either of the rotary-wing heads is turned, make sure that the rotary-wing blades do not collide. Damage to the assemblies could result.

(1) Open the pylon leading edge hinged fairing and lower fairing.

(2) Do not remove the lockwire and locking bolt from dephasing arm on combining transmission.

(3) Deleted

(4) Deleted

j. Pull the aft left rotary-wing blade into the rack assembly. Use the attached tiedown rope. Place the blade in the cradle. Secure the blade with cradle strap (3). Adjust the height of cradle. Remove the tiedown rope.

k. Move up the latch of the rotary-wing phasing mechanism. Do not install the bolt. Lockwire the bolt to the handle. Use lockwire (C206).

l. Install the lower section of aft pylon lower leading edge fairing. Close the aft pylon hinged fairing.

m. Operate the apu for electrical and hydraulic power. (Refer to para 1-98.)

n. Set cockpit controls as follows:

(1) Position the SPEED TRIM selector switch to MAN.

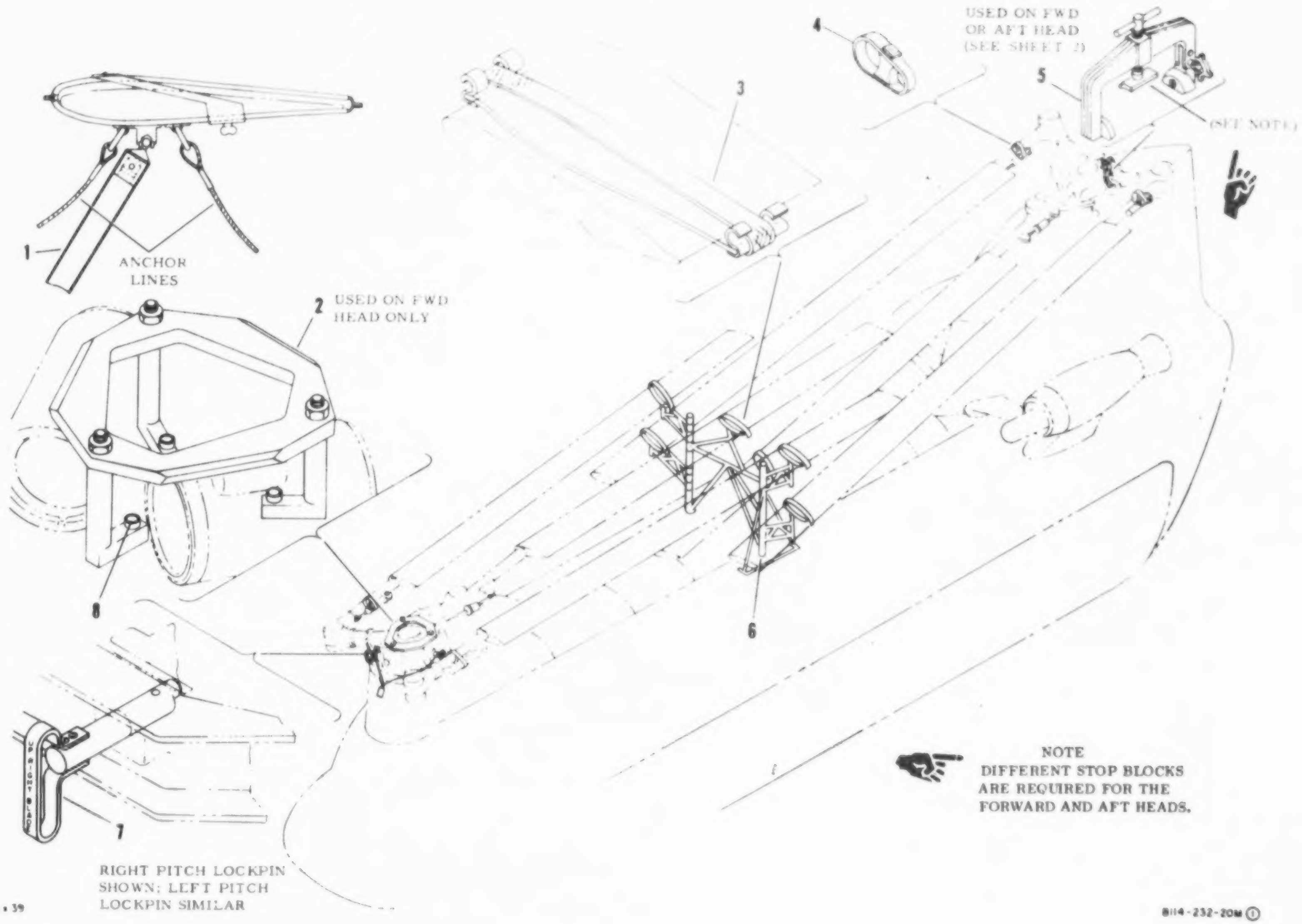
(2) Hold the AFT MANUAL OPERATION LONG CYC TRIM switch to EXTEND until the CYCLIC TRIM ACT indicator on center instrument panel stabilizes (about 120 knots).

(3) Rotate the trim wheel to zero.

(4) Position the pitch and roll control stick at exact neutral.

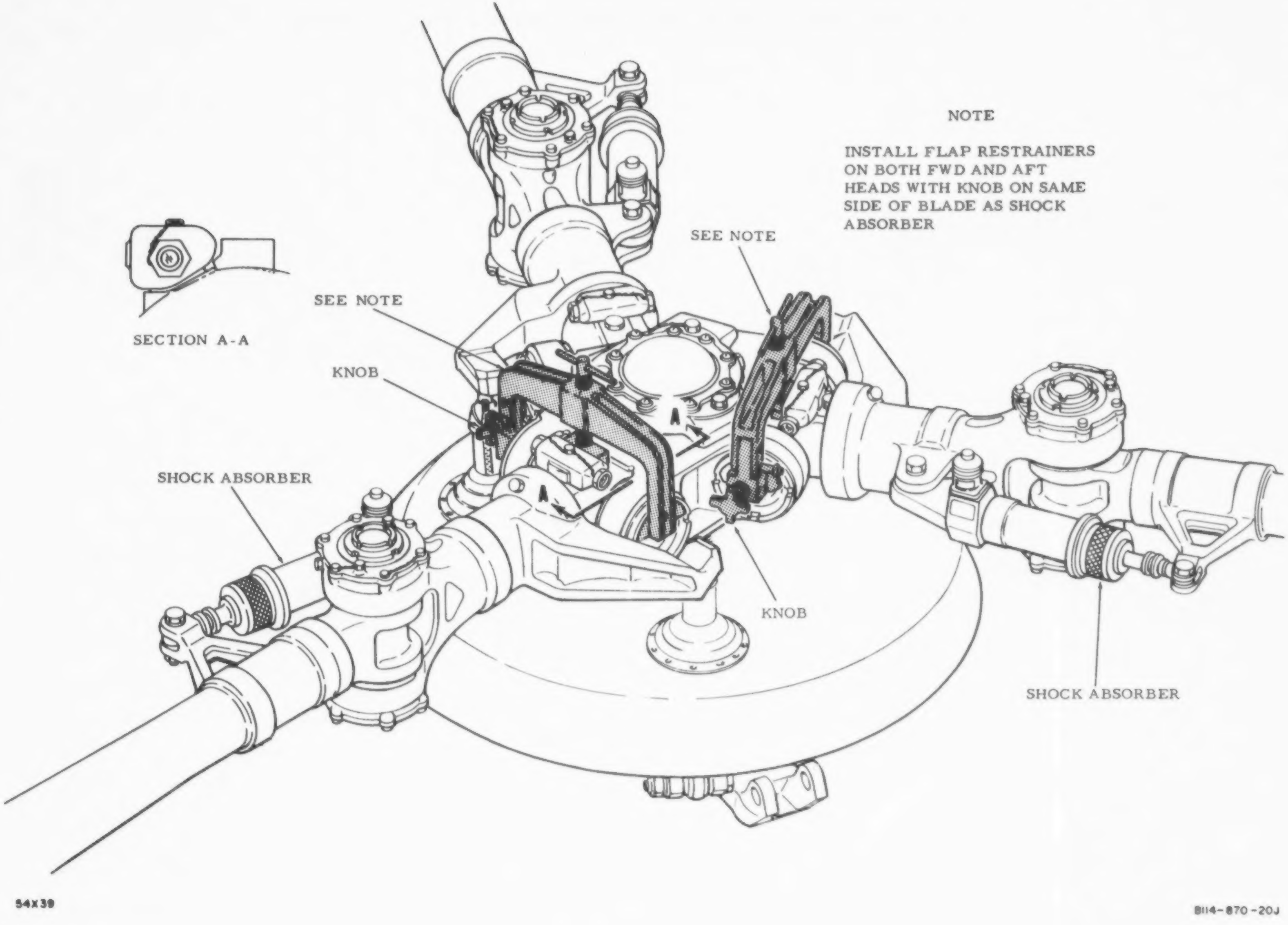
Legend for figure 1-24

1. Blade folding pole (T6)
2. Flap restrainer 114E5044-17
3. Cradle strap 114E5110-77
4. Blade shock absorber clamp (T2)
5. Flap restrainer (T98)
6. Rotary-wing storage rack assembly (T3)
7. Pitch lockpin (T26)
8. Flap restrainer pins 114E5044-13
9. Lead-lag rigging tool (CH-47B) (T73)
10. Lead-lag rigging tool (CH-47C) (T74)


1
ANCHOR LINES
2
USED ON FWD HEAD ONLY
3
4
USED ON FWD OR AFT HEAD (SEE SHEET 2)
5
(SEE NOTE)
6
7
8
RIGHT PITCH LOCKPIN SHOWN; LEFT PITCH LOCKPIN SIMILAR
54 x 39
B114-232-20M ①

NOTE
DIFFERENT STOP BLOCKS ARE REQUIRED FOR THE FORWARD AND AFT HEADS.

Figure 1-24. Rotary-Wing Blade Folding Equipment (Metal Blades) (Sheet 1 of 3)


SECTION A-A
SEE NOTE
KNOB
SHOCK ABSORBER
SEE NOTE
KNOB
SHOCK ABSORBER
A
A
54X39
BI14-870-20J

NOTE

INSTALL FLAP RESTRAINERS
ON BOTH FWD AND AFT
HEADS WITH KNOB ON SAME
SIDE OF BLADE AS SHOCK
ABSORBER

Figure 1-24. Rotary-wing Blade Folding Equipment (Sheet 2 of 3)

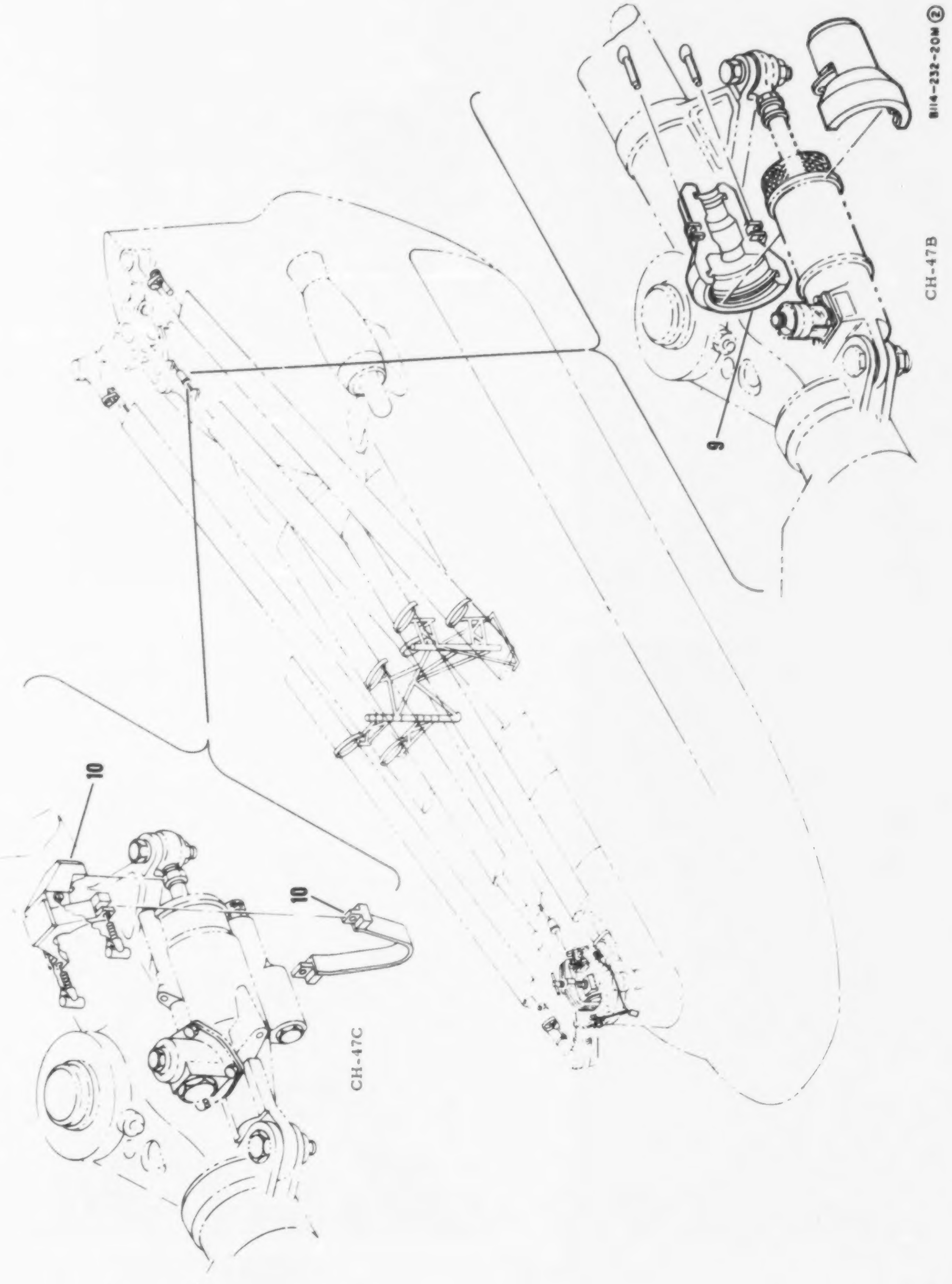
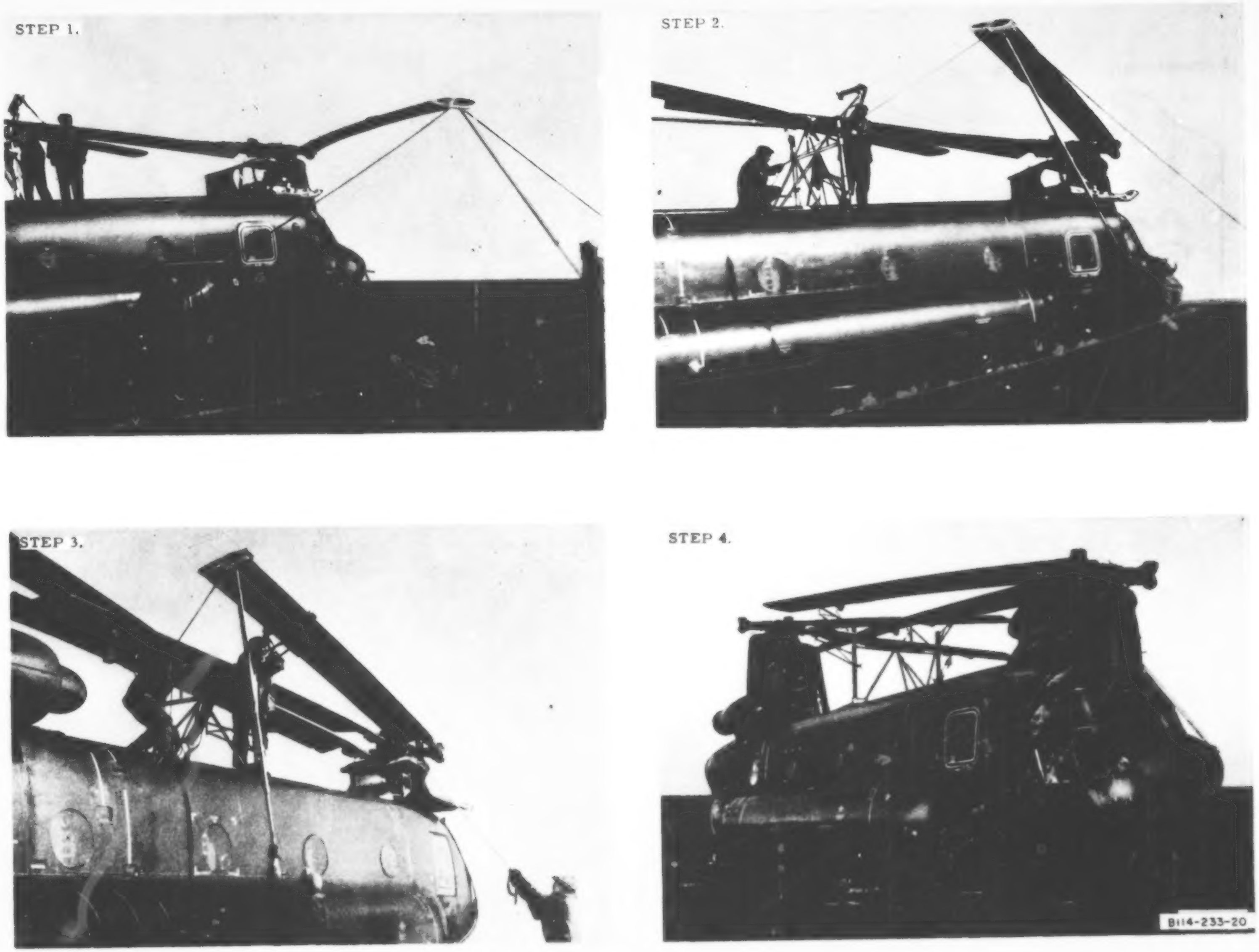

B114-232-20M ②
CH-47B
9
CH-47C
10
10
54 x 39

Figure 1-24. Rotary-Wing Blade Folding Equipment (Metal Blades) (Sheet 3 of 3)



STEP 1.

STEP 2.

STEP 3.

STEP 4.

39x54

Figure 1-25. Rotary-Wing Blade Folding Sequence (Metal Blades)

(5) Position the thrust control lever so that 6 inches of thrust lever shaft are exposed.

(6) Position the directional pedals at exact neutral.

CAUTION

Observe LEFT and RIGHT markings and UP arrows on pitch lockpins. If pins are not installed correctly, damage to rotor controls can occur. After aft pitch lockpins are installed, do not move the thrust control or rotate rotary-wing heads. Damage to the flight control system will result.

o. Install aft pitch lockpins (7) in the pitch arms of the aft rotary-wing blades to be folded as follows:

(1) Visually check pitch lockpin hole alignment.

(2) If all holes are aligned, install the aft pitch lockpins. The left pin shall be in the lower hole of the flange on the pitch shaft. The right pin shall be in the upper hole. It may be necessary to move the thrust lever slightly to align lockpin holes. Coordinate control setting changes with hand signals thru a relay man.

p. Hold the FWD MANUAL OPERATION LONG CYC TRIM switch to EXTEND until the CYCLIC TRIM ACT indicator on center instrument panel stabilizes (about 120 knots).

CAUTION

Observe LEFT and RIGHT markings and UP arrows on pitch lockpins. If pins are not installed correctly, damage to rotor controls can occur. After forward pitch lockpins are installed, do not move any of the cockpit controls or rotate the rotary-wing heads. Damage to the flight controls system will result.

q. Install forward pitch lockpins (7) in pitch arms of the two rotary-wing blades that are to be folded. Visually check pitch lock hole alignment. If holes are aligned, install lockpins. If hole alignment is required, move the FWD MANUAL OPERATION LONG CYC TRIM switch slightly in either direction to facilitate pin installation.

r. Shut down the apu. (Refer to para 1-98.)

s. Install the two top outboard cradles on the rack assembly.

t. Slip a blade folding pole on either of the forward blades to be folded.

u. Station one man on the blade folding pole and one man on each of the two pole anchor ropes. Each rope man shall remain inboard of the pole to prevent pulling the pole off the blade and to maintain maximum control of the blade. (See fig. 1-25.)

v. Position the rotary-wing blade about the center of its lead-lag plane. Maintain it at this location.

WARNING

With the shock absorber disengaged, the rotary-wing blade shall be restrained to prevent injury to personnel or damage to the assembly or the helicopter.

w. On helicopters without MWO 55-1500-210-30/42, (positive retention bolts) disconnect the shock absorber from the pitch-varying housing as follows: (See fig. 1-26.)

(1) With the blade held in position, tie an anchor line to the helicopter so the blade is restrained in the lead and lag directions.

(2) Remove cotter pin (1), nut (2), and washer (3).

(3) Lead or lag the tip of the blade slightly to relieve binding. Remove bolt (4) and countersunk washer (5) from mounting lug (6).

(4) Pull the rod-end from between the inboard mounting lugs.

NOTE

On 114H5900 series absorbers, spacer washer (7) is installed.

x. On helicopters with MWO 55-1500-210-30/42 (positive retention bolts), disconnect the shock absorber from the pitch-varying housing as follows:

(1) (See fig. 1-26.) With the blade positioned over the fuselage, tie an anchor line to the helicopter so the blade is restrained in the lead and lag directions.

(2) Remove cotter pin (1). Loosen nut (2). Depress the pawl on bolt (8) and thread the nut off the bolt. Depress pawl and remove washer (3).

(3) Lead or lag the tip of the blade slightly to relieve binding. Pull bolt (8) up next to the lug. Depress the pawl on the bolt and pull the bolt into the lug. Keep the stackup together and pull the bolt out.

(4) Pull the rod-end bearing from between the mounting lugs.

NOTE

On absorbers 114H5900 series, spacer washer (7) is installed.

CAUTION

Make sure pitch lockpins are seated prior to folding each blade.

y. Rotate the blade shock absorber toward the blade tip. Secure the shock absorber to the blade spar with a blade damper clamp (4, fig. 1-24).

z. Slowly swing the blade around to the rack assembly. The blade will tend to fall toward the rack assembly as it nears the fuselage. If necessary, this falling tendency of the blade can be restrained by the rope. Pass slack rope to a man on the fuselage. The pole man may have to lift the blade into the cradle as the rope men control blade movement.

aa. After the blade is in the cradle, remove the blade folding pole.

ab. Secure the blade in the cradle. Use the cradle strap.

ac. Fold the remaining forward blade. (Refer to steps t. thru ab.)

CAUTION

Ensure that the aft blade cradles are positioned forward (see fig. 1-27) to provide clearance between the blade trim tabs and the cradles. If cradles are in their normal position, blade trim tabs can be damaged.

ad. Reverse the folding pole strap by releasing the fastener holding the strap to underside of pole blade cradle. Move the strap to the opposite side of the cradle and fasten the strap in fitting.

ae. Fold aft blades individually. (Refer to steps t. thru ac.) Make sure the cradle pivot for the aft left blade is positioned correctly in the rack. (See fig. 1-27.)

af. Close the work platforms on both pylons.

ag. Place a tag on the flight controls stating: DO NOT MOVE FLIGHT CONTROLS OR OPERATE ENGINES—BLADES FOLDED.

1-70. Blade Unfolding (Metal Blades). (See fig. 1-24 and 1-25.)

a. Open the work platforms on both sides of forward and aft pylons.

b. Slip the folding pole on either aft blade.

WARNING

Hold the anchor lines on the folding pole firmly. Damage to equipment or injury to personnel will result if the rotary-wing blade swings free.

c. Working from the fuselage, maintain control of one anchor rope until the blade clears the fuselage. Position the other anchor rope man to the rear of the pole man, but in towards the rotary-wing hub, to prevent pulling the pole off the blade tip. (See fig. 1-25.)

d. Release the rack assembly cradle strap.

e. Lift the blade from blade cradle. Slowly swing the blade to its normal operating position.

CAUTION

Make sure the pitch lockpins are removed before the rotor heads are rotated. Otherwise, damage to equipment will result.

f. Remove pitch lockpin (7, fig. 1-24) from the unfolded blade. If lockpin removal is difficult, proceed as follows:

(1) Swing the blades slightly forward.

(2) Remove the lockpin and return the blade to its unfolded operating position.

g. Remove clamp (4) securing the direct action shock absorber to the blade spar.

h. Secure the direct action shock absorber to the pitch-varying housing. (See fig. 1-26.)

(1) Slide the end of the shock absorber between the inboard mounting lugs.

NOTE

On absorber 114H5900 series, spacer washer (7) is installed.

(2) Place countersunk washer (5), countersink toward the head, on bolt (4 or 8). Align holes thru the mounting lugs, bushings and bearing. Install the bolt.

CAUTION

On 71-20948 and subq and helicopters with MWO 55-1500-210-30/42, use nut AN320-12 with a positive retention bolt. Make sure the pawl is extended.

(3) Install high strength washer (3) and nut (2). **TORQUE THE NUT TO 108 TO 125 POUND-FEET.** Align cotter pin holes and install cotter pin (1).

NOTE

On helicopters with MWO 55-1500-210-30/42, thick or thin washers may be used under the nut to align cotter pin holes.

i. Remove the folding pole from the blade.

j. Unfold the remaining aft blade. (Refer to preceding steps b. thru i.)

CAUTION

Be careful handling the flap restrainer. If you drop it, it can damage rotary-wing head components.

k. Remove the aft flap restrainer from the aft rotary-wing head. (See fig. 1-24.)

l. Remove cradle strap (3) securing the remaining aft blade to rack assembly (6).

m. Remove lead-lag rigging tool (9 or 10) from the aft blade.

n. Lift the aft blade. Manually rotate the aft rotary-wing head until the blade is clear of the rack assembly.

o. Unfold the forward blades. (Refer to steps b. thru n.)

p. Remove two top outboard blade cradles from the rack assembly.

q. Remove the two fitting lockpins. Remove the rack assembly.

r. Open the aft pylon leading edge hinged fairing and raise the lower section of the leading edge fairing.

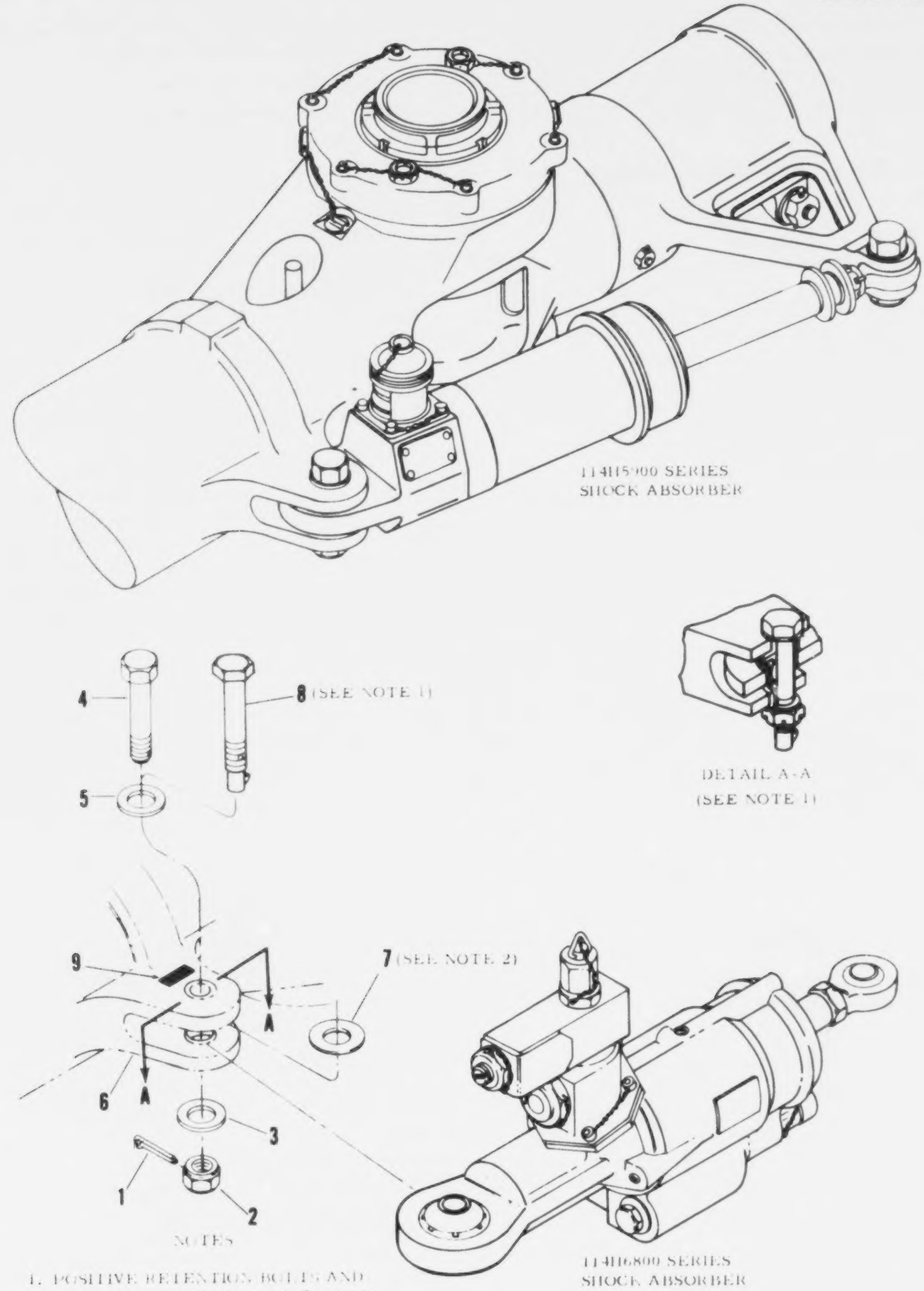
s. Phase the rotary-wing system. (Refer to para 6-1.1.)

t. Secure the aft pylon leading edge hinged fairing and the lower section of the leading edge fairing.

u. Check the rotary-wing system for removal of all tools and loose objects, and for proper closure of the fairing.

Legend for figure 1-26

1. Cotter pin
2. Nut
3. Washer
4. Bolt
5. Countersunk washer
6. Mounting lug
7. Spacer washer
8. Positive retention bolt
9. Placard


114H5900 SERIES
SHOCK ABSORBER
4
8 (SEE NOTE 1)
5
DETAIL A-A
(SEE NOTE 1)
9
7 (SEE NOTE 2)
A
A
6
3
1
2
114H6800 SERIES
SHOCK ABSORBER
42X54
B114-38-20N

NOTES

1. POSITIVE RETENTION BOLTS AND PLACARDS INSTALLED ON 71-20948 AND SUBQ. AND HELICOPTERS WITH MWO 55-1500-210-30/42.
2. WASHER (7) USED WITH 114H5900 SERIES SHOCK ABSORBER ONLY.

Figure 1-26. Disconnecting Shock Absorbers for Blade Folding (Metal Blades)

v. Close the work platform on both pylons.

w. Remove the tag from the flight controls station: DO NOT MOVE FLIGHT CONTROLS OR OPERATE ENGINES — BLADES FOLDED.

1-71. Alternate Blade Folding Method (Helicopters with Metal Blades). (See fig. 1-24 thru 1-27.)

CAUTION

Do not use this alternate rotary-wing blade folding procedure for helicopters parked outdoors. Alternate blade folding is to be used only when helicopters are to be hangared quickly and blades folded because of space limitations.

NOTE

There are no blade folding procedures for CH-47C helicopters fitted with fiberglass rotary-wing blades. If space is limited, they must be removed. (Refer to para 5-132.13.)

a. Open the work platforms on both sides of forward and aft pylons.

b. Install a lead-lag rigging tool (9 or 10, fig. 1-24) on one aft blade shock absorber.

NOTE

The shock absorber shall be at its center of travel to install the rigging tool. The shock absorber may be extended or retracted by restraining hub rotation and moving the blade in which the rigging tool is to be installed.

c. Manually rotate the rotary-wing heads until the aft blade with rigging tool installed is in the aft position, on the helicopter centerline. One forward blade will be over the center of the fuselage.

d. Install a lead-lag rigging tool (9 or 10) on shock absorber of forward blade centered over the fuselage. (Refer to step b.)

CAUTION

Be careful in handling the flap restrainer. If you drop it, it can damage rotary-wing head components.

e. Install a flap restrainer (2 or 5) on forward rotary-wing head. (Refer to para 1-69.)

f. Manually rotate the rotary-wing system until the blade which is centered over the fuselage is about 3 feet away from the side of the fuselage. Then install rack assembly (6) as follows:

(1) Remove the two top outboard cradles from the rack assembly.

(2) Position the rack assembly on top of fuselage with wide base section opposite crown walkway.

(3) Install rack assembly into fuselage fittings location at sta 317. Make sure two lockpins are locked into the fuselage fittings before releasing rack assembly.

g. Manually rotate the rotary-wing system until the blade equipped with the lead-lag rigging tool is centered over the fuselage. Place the blade in the rack assembly cradle. Secure it with cradle strap (3).

h. Adjust the height of the cradle. Make sure blade weight holds rack assembly in fuselage fittings.

i. Start and operate the apu. (Refer to para 1-98.)

j. Set the cockpit controls as follows:

(1) Position the SPEED TRIM selector switch to MAN.

(2) Hold AFT MANUAL OPERATION LONG CYC TRIM switch to EXTEND position until the CYCLIC TRIM ACT indicator on the center instrument panel stabilizes (about 120 knots).

(3) Rotate the trim wheel to zero.

(4) Position the pitch and roll control stick at exact neutral.

(5) Position the thrust control lever so 6 inches of thrust lever shaft are exposed.

(6) Position the directional pedals at exact neutral.

CAUTION

Observe the LEFT and RIGHT markings and UP arrow on pitch lockpins. If pins are not installed correctly, damage to rotor controls can occur. After aft pitch lockpins are installed, do not move the thrust control or rotate the rotary-wing heads. Damage to the flight control system will result.

k. Install aft pitch lockpins (7) in the pitch arms of the aft blades to be folded. Visually check the pitch lock hole alignment. If the holes are aligned, install the lockpins. The left pin shall be in the lower hole of the flange on the pitch shaft. The right pin shall be in the upper hole. It may be necessary to move the thrust lever slightly to align the lockpin holes. Coordinate control settings changes with hand signals thru a relay man.

l. Hold the FWD MANUAL OPERATION LONG CYC TRIM switch to EXTEND until the CYCLIC TRIM ACT indicator on the center instrument panel stabilizes (about 120 knots).

CAUTION

Observe LEFT and RIGHT markings and UP arrows on pitch lockpins. If pins are not installed properly, damage to rotor controls can occur. After forward pitch lockpins are installed, do not move cockpit controls or rotate rotary-wing heads. Damage to flight control system will result.

m. Install forward pitch lockpins (7) into the pitch arms of the two blades to be folded. Visually check pitch lock hole alignment. If holes are aligned, install lockpins. If hole alignment is required, move the FWD MANUAL OPERATION LONG CYC TRIM switch slightly in either direction to facilitate pin installation.

n. Shut down the apu. (Refer to para 1-98.)

o. Install the two top outboard cradles on the rack assembly.

p. Slip the cradle of blade folding pole (1) on either forward blade to be folded.

q. Station one man on the blade folding pole and one man on each of the two pole anchor ropes. One rope man

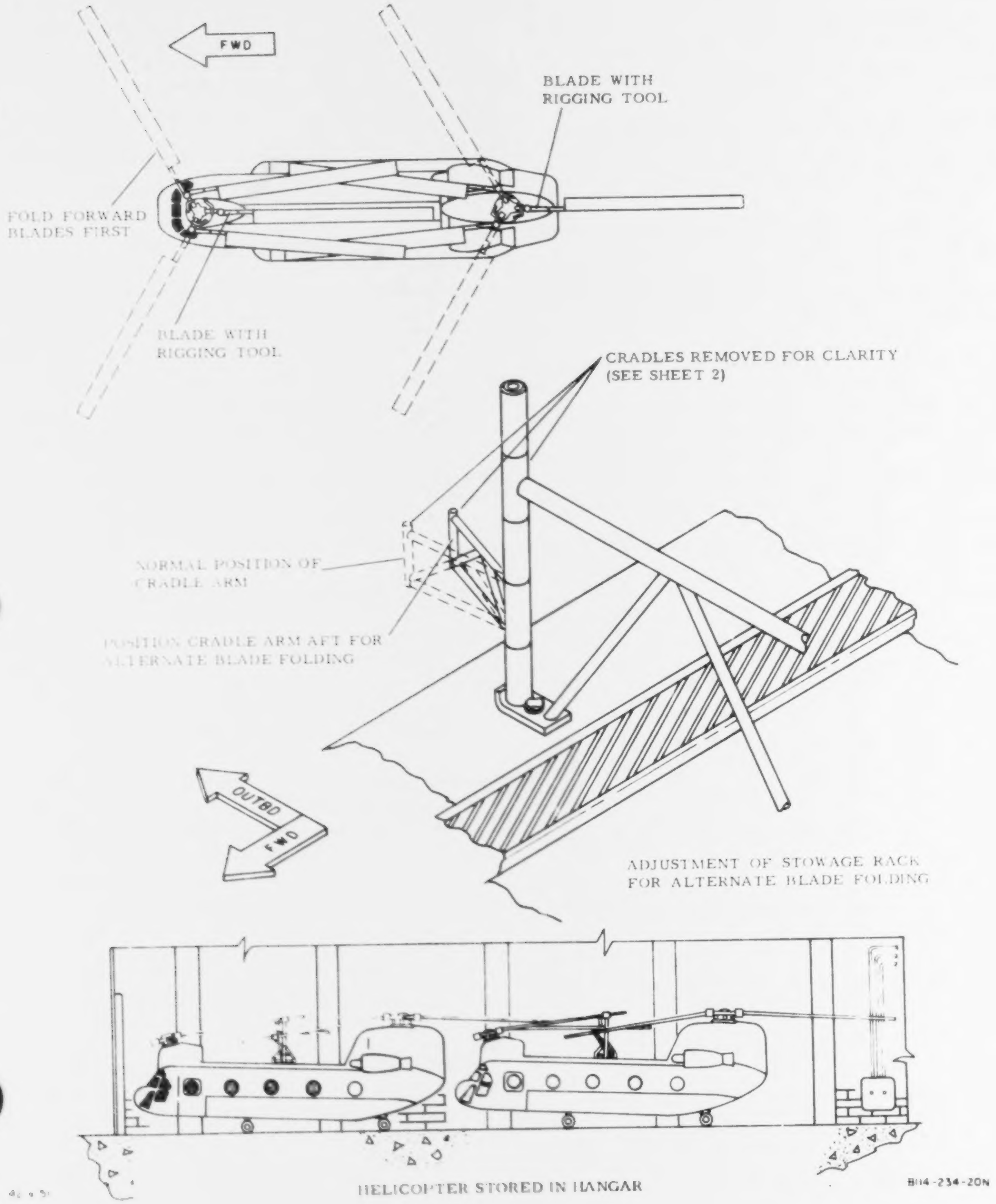

FWD
BLADE WITH RIGGING TOOL
FOLD FORWARD BLADES FIRST
BLADE WITH RIGGING TOOL
CRADLES REMOVED FOR CLARITY (SEE SHEET 2)
NORMAL POSITION OF CRADLE ARM
POSITION CRADLE ARM AFT FOR ALTERNATE BLADE FOLDING
OUTBD
FWD
ADJUSTMENT OF STOWAGE RACK FOR ALTERNATE BLADE FOLDING
HELICOPTER STORED IN HANGAR
B114-234-20N

Figure 1-27. Alternate Rotary-Wing Blade Folding (Metal Blades) (Sheet 1 of 2)

shall remain on either side (front and rear), but in towards the rotary-wing hub, of the pole man to maintain maximum control of the blades. (See fig. 1-25.)

r. Position the blade about the center of its lead-lag plane and maintain it at this location.

WARNING

> With the shock absorber disengaged, the rotary-wing blade shall be restrained to prevent injury to personnel, or damage to the assembly or helicopter.

s. Disconnect the shock absorbers from the pitch-varying housing. (See fig. 1-26.)

t. Rotate the shock absorber towards the blade tip. Secure the shock absorber to the blade spar with a blade damper clamp (4, fig. 1-24.)

CAUTION

> Make sure that the pitch lockpins are seated and have not pulled out prior to folding each blade.

u. Slowly swing the blade around to the rack assembly. As it nears the fuselage, the blade will have a tendency to fall towards the rack assembly. If necessary, this falling tendency of the blade can be restrained with the outboard rope. Pass the slack inboard rope to the man on the fuselage. The pole man may have to lift the blade into the cradle as the rope men control the blade movement.

v. After the blade is in the cradle, remove the blade folding pole.

w. Secure the blade in the cradle with cradle strap (3).

x. Fold the remaining forward blade. (Refer to steps o. thru w.)

CAUTION

> Ensure that aft blade cradles are positioned forward of their normal position (fig. 1-27) to provide clearance between blade trim tabs and cradles. If cradles are in their normal position, blade trim tabs may be damaged.

y. Reverse the folding pole cradle strap by releasing the fastener securing the strap to the underside of the pole

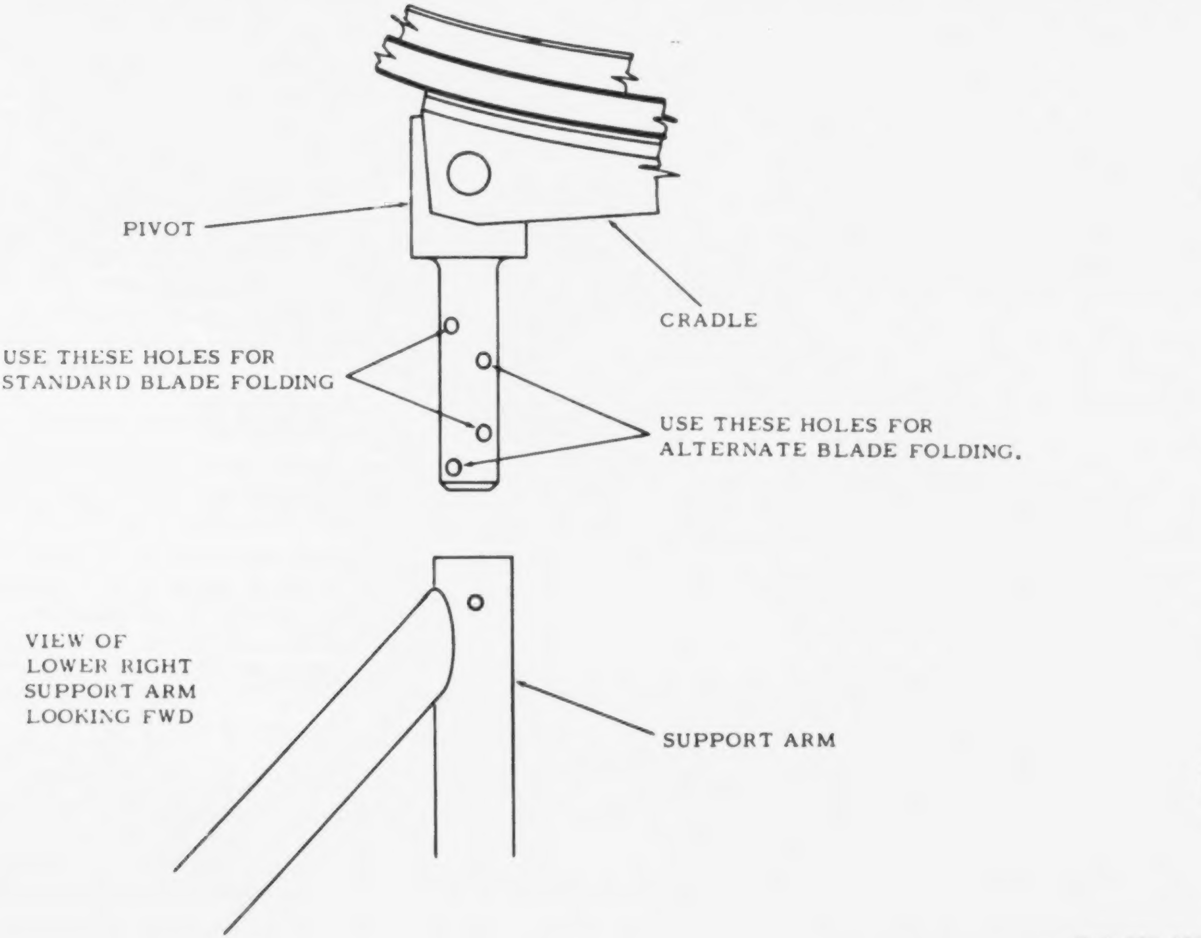

PIVOT
CRADLE
USE THESE HOLES FOR STANDARD BLADE FOLDING
USE THESE HOLES FOR ALTERNATE BLADE FOLDING.
VIEW OF LOWER RIGHT SUPPORT ARM LOOKING FWD
SUPPORT ARM
B114-874-20F

Figure 1-27. Alternate Rotary-Wing Blade Folding (Metal Blades) (Sheet 2 of 2)

blade cradle. Move the strap to the opposite side of the cradle. Fasten the straps in the fitting.

z. Fold the two aft blades. (Refer to steps p. thru y. above.) Check the cradle pivot for the aft left blade for proper position in the rack. (See fig. 1-27.)

aa. Close the work platforms on both sides of both pylons.

ab. Place a tag on the cockpit flight controls stating: DO NOT MOVE FLIGHT CONTROLS. Place a tag on the engine controls stating: DO NOT OPERATE ENGINES—BLADES FOLDED.

1-72. Alternate Blade Unfolding Method (Metal Blades). (See fig. 1-24 thru 1-27.)

a. Open work platforms on both sides of forward and aft pylons.

b. Slip the blade folding pole cradle on either of the aft blades to be unfolded.

WARNING

Hold the anchor ropes firmly. Injury to personnel or damage to equipment will result if a blade swings free.

c. Working from the fuselage, maintain control of one anchor rope until the blade clears the fuselage. Position the other anchor rope man outboard of the pole man.

d. Release the stowage rack assembly blade cradle strap.

e. Lift the blade from the cradle. Slowly swing the blade to its operational position.

CAUTION

Make sure pitch lockpins are removed before rotor heads are rotated. Otherwise, damage to equipment will result.

f. Remove pitch lockpin (7, fig. 1-24) from the unfolded blade. If lockpin removal is difficult, proceed as follows:

(1) Swing the blade slightly forward.

(2) Remove the lockpin and return the blade to its unfolded operational position.

g. Remove clamp (4) retaining the shock absorber to the blade spar.

h. Secure the shock absorber to the pitch-varying housing. (See fig. 1-26.)

i. Remove the folding pole from the blade.

j. Unfold the remaining aft blade. (Refer to steps b. thru i.)

k. Reverse the folding pole blade cradle strap by releasing the fastener securing the strap to the underside of the pole blade cradle. Move the strap to the opposite side of the cradle and fasten the strap in the fitting.

CAUTION

Make sure pitch lockpins (7, fig. 1-24) are removed prior to head rotation. Otherwise, damage to equipment will result.

l. Unfold the two forward blades. (Refer to steps b. thru i.)

m. Remove the rack assembly cradle strap securing unfolded blade to rack assembly (6).

n. Remove the two upper outboard cradles from the rack assembly.

o. Remove the two lockpins securing the rack assembly to the fuselage fittings.

p. Lift the blade centered over the fuselage. Remove the rack assembly.

q. Remove lead-lag rigging tool (9 or 10) from the forward blade shock absorber.

CAUTION

Be careful handling flap restrainers. If you drop one, it can damage rotary-wing head components.

r. Remove forward flap restrainers (2 or 5) from the forward rotary-wing head.

s. Manually rotate the rotary-wing system until the aft blade equipped with lead-lag rigging tool (9 or 10) is centered over the fuselage.

t. Remove the lead-lag rigging tool from the aft blade shock absorber.

u. Check the rotary-wing system for proper lockwiring of quick-disconnect handles. Check that all tools and loose objects have been removed.

v. Close the work platforms on both sides of the forward and aft pylons.

w. Remove the tags from the cockpit that state: DO NOT MOVE FLIGHT CONTROLS and DO NOT OPERATE ENGINES—BLADES FOLDED.

1-73. Towing.

The helicopter can be towed in either of two ways, as described in para 1-74 and 1-75.

1-74. Normal Towing. (See fig. 1-28.) This is the preferred towing procedure for CH-47B and CH-47C helicopters. It is done using a standard tow bar.

a. Check that the battery is installed and connected.

b. Check that the BTRY BUS FEEDER and UTILITY HYD SYS CIRCUIT breakers are pushed in.

c. Check that the utility hydraulic system accumulator is pressurized to 3,000 psi.

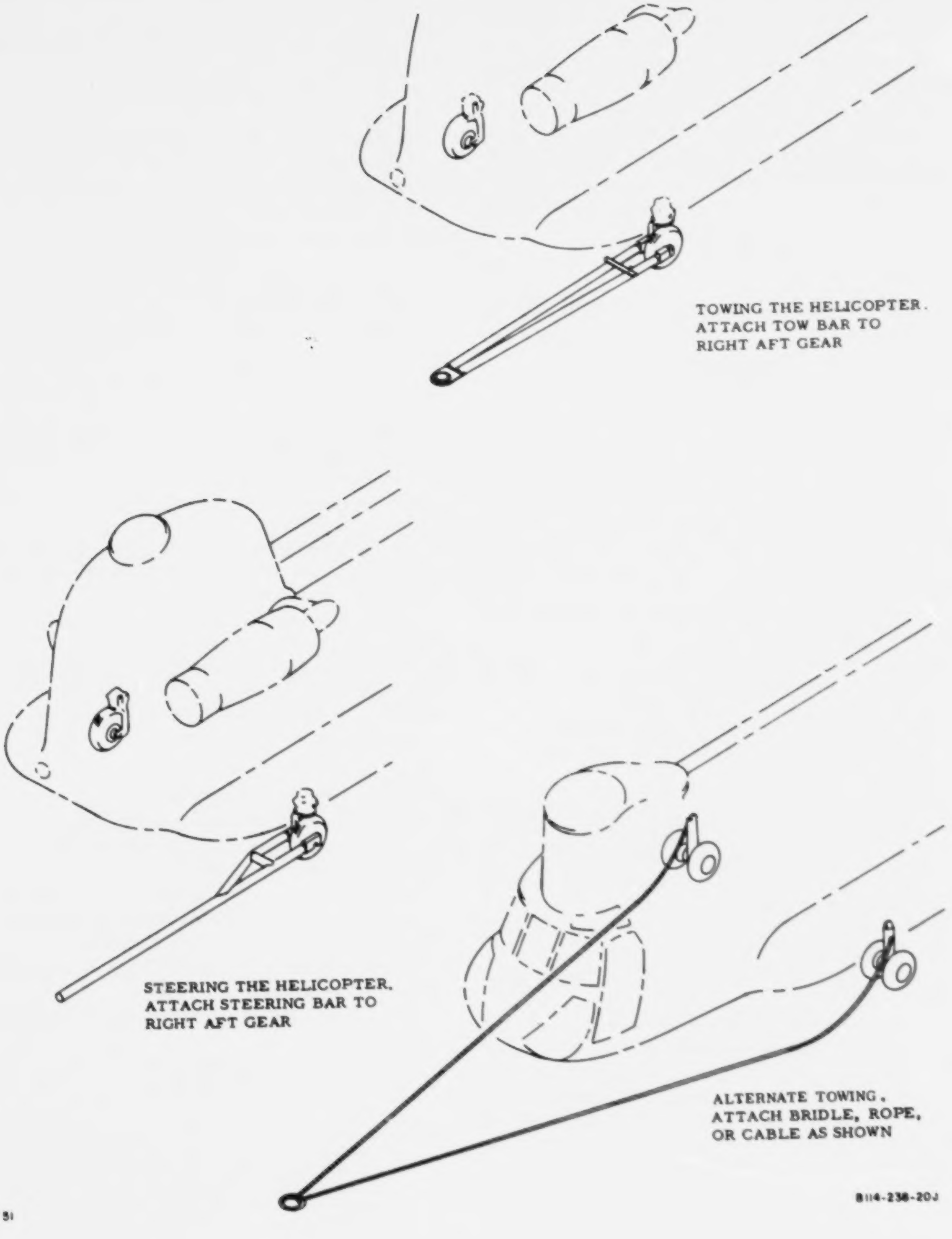
d. Make sure that the aft swivel locking mechanism is disengaged.

CAUTION

Do not proceed further until a visual inspection is made to ensure that swivel locking mechanism is disengaged (unlocked) and the swivel lock switch is in the RELEASE position. Damage to equipment will result if helicopter is towed with the swivel locking mechanism engaged (locked).

e. Attach the tow bar to the right aft landing gear axle. Secure the spreader bar to the tow bar.

f. Connect the tow bar to the towing vehicle.



TOWING THE HELICOPTER. ATTACH TOW BAR TO RIGHT AFT GEAR

STEERING THE HELICOPTER. ATTACH STEERING BAR TO RIGHT AFT GEAR

ALTERNATE TOWING, ATTACH BRIDLE, ROPE, OR CABLE AS SHOWN

Figure 1-28. Towing the Helicopter

g. Station one crewmember in the cockpit to place the UTILITY SYSTEM switch to ON and to operate the brakes when required.

NOTE

Wheel brakes can be operated with or without hydraulic boost pressure. However, for emergency stopping, application of boost pressure is preferred. To conserve battery power, the UTILITY SYSTEM switch should be placed to OFF until hydraulic boost pressure is needed.

CAUTION

If the helicopter is to be towed in any direction other than forward, swivel the free wheel to within 10° of the trail position. Otherwise, damage to the tire and landing gear can result. To avoid damaging the rotary-wing blades, station a crewmember on each side of the helicopter to observe clearances. If it becomes necessary to rotate either rotary-wing head independently of the other, dephase the rotary-wing system. (Refer to para 1-69, step i.)

h. Remove the chocks from the wheels. Release the parking brakes. If the helicopter is to be towed in any direction other than forward, swivel the free wheel to within 10° of the trail position.

i. Tow the helicopter slowly. Avoid sudden starts and stops.

j. When towing is completed, park the helicopter. (Refer to para 1-83.) Disconnect towing equipment from the helicopter. Properly phase the free wheel to the trailing position.

k. Place aft wheel swivel switch in the release position before towing.

1-75. Alternate Towing. (See fig. 1-28.) This method of towing is used only when the normal method of towing cannot be used.

a. Repeat steps a. thru d. of para 1-74.

CAUTION

Be sure that the towing rope or cable is long enough to allow turning and stopping clearance between the towing vehicle and the helicopter. Two 29-foot lines will provide clearance of about 10 feet.

b. Attach a towing bridle, if available, or a rope or cable of sufficient length and strength, to tiedown rings on forward or aft landing gear, whichever is applicable.

CAUTION

Be careful when towing with rope or cable. Helicopter brakes are the only means of stopping the helicopter. Station a crewmember on each side of the helicopter to stand by with wheel chocks in event of brake malfunction and to watch for blade clearance.

c. If the helicopter is being towed forward, attach a steering bar to an aft landing gear axle.

d. Connect a towing bridle, towing rope, or cable to towing vehicle. Position the towing vehicle so that slack is just removed from towing bridle, rope or cable.

e. Perform steps g. and h. of para 1-74.

f. Tow the helicopter slowly. Avoid sudden starts and stops.

g. When towing is completed, park the helicopter. (Refer to para 1-83.) Disconnect towing equipment from the helicopter. Properly phase the free wheel to the trailing position.

1-76. Jacking.

The helicopter may be jacked at fuselage, pads or at the landing gear, as described in para 1-77 thru 1-79.

1-77. Jacking at Forward Fuselage Jack Pad. (See fig. 1-29.)

CAUTION

Make sure the cargo ramp will not strike the ground during jacking. Make sure the rotary-wing blades will not be damaged by striking an obstruction. To prevent fuselage damage, do not jack the front of the helicopter when wind or gust velocity exceeds 20 knots.

a. Jack the helicopter at the forward fuselage jack pad (3) as follows:

(1) If the helicopter is to be jacked while the wind is blowing, make sure the aft wheels are aligned and the swivel locks are locked.

CAUTION

Do not restrain the rolling movement of the aft wheels. The wheels must roll to compensate for changes in helicopter attitude.

(2) Remove the chocks and release the parking brake.

CAUTION

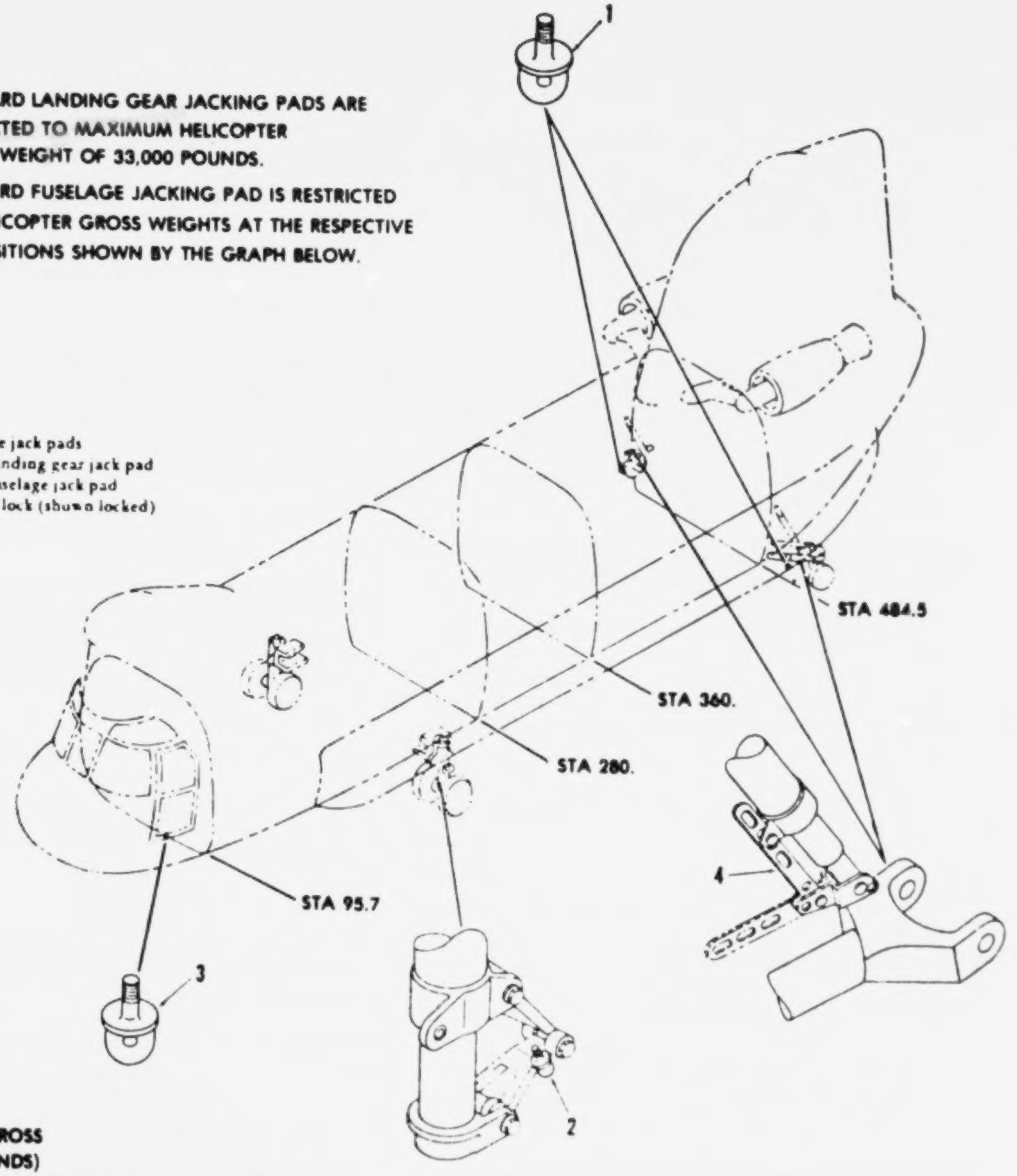
The forward fuselage jack pad is restricted to the helicopter maximum gross weight and center of gravity limitations shown by the graph in fig. 1-29. If the limits are exceeded, equipment and fuel must be removed from the helicopter before jacking or damage to the helicopter structure can result. If the limits cannot be met, jack the forward end of the helicopter at the forward landing gear jack pads as directed in para 1-78.

(3) Position a jack 1214-151 or equivalent at forward fuselage jack pad (3).

NOTES:

1. FORWARD LANDING GEAR JACKING PADS ARE RESTRICTED TO MAXIMUM HELICOPTER GROSS WEIGHT OF 33,000 POUNDS.
2. FORWARD FUSELAGE JACKING PAD IS RESTRICTED TO HELICOPTER GROSS WEIGHTS AT THE RESPECTIVE CG POSITIONS SHOWN BY THE GRAPH BELOW.

1. Aft fuselage jack pads
2. Forward landing gear jack pad
3. Forward fuselage jack pad
4. Oleo static lock (shown locked)



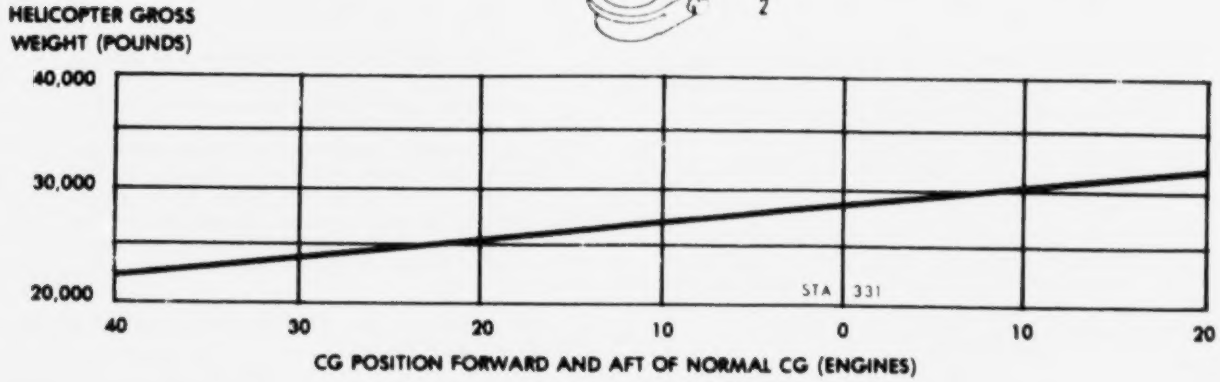


Figure 1-29. Jacking Provisions

(4) Raise the jack enough to absorb some of the helicopter weight.

(5) Deflate and collapse the forward landing gear shock struts as follows:

CAUTION

The high pressure air valve does not contain a valve core. Consequently, if the valve leaks internally, air will be trapped between the cap and the metal-to-metal seal of the valve. Before removing the cap, loosen it one to two turns to allow this trapped air to escape.

(a) Remove the cap from the high pressure air valve on each strut.

(b) Hold the air valve body with a wrench and turn the upper hex nut counterclockwise ½ to 1½ turns. Allow the air pressure to discharge completely. Collapse the strut.

(c) Secure the strut in the collapsed position with rope or other suitable means to prevent extension during jacking.

(6) Jack the helicopter to the desired height.

b. Lower the helicopter at forward fuselage jack pad (3) as follows:

CAUTION

Make sure the rotary-wing blades will not be damaged by striking an obstruction.

(1) Lower the jack slowly and smoothly until it is free of the jack pad.

(2) Remove the jack from beneath the helicopter.

(3) Remove the ropes and inflate the forward landing gear shock struts.

(4) Install the chocks and set the parking brake.

1-78. *Jacking at Forward Landing Gear Jack Pads.* (See fig. 1-29).

CAUTION

Make sure the ramp will not strike the ground during jacking. Make sure the rotary-wing blades will not be damaged by striking an obstruction. To prevent landing gear and fuselage damage, do not jack the front of the helicopter when wind or gust velocity exceeds 20 knots.

a. Jack a single forward landing gear as follows:

CAUTION

Do not restrain the movement of the wheels. The wheels must move to compensate for changes in helicopter attitude.

(1) Remove the wheel chocks and release the parking brake.

CAUTION

Each forward landing gear jack pad is restricted to a helicopter maximum gross weight of 33,000 pounds. If helicopter gross weight is greater, equipment must be removed before jacking to prevent landing gear or fuselage damage. (See fig. 1-29)

(2) Position a jack A-5 or equivalent at a forward landing gear pack pad (2).

(3) Jack the helicopter to the desired height.

b. Lower a single forward landing gear as follows:

CAUTION

Make sure the blades will not strike an obstruction such as a workstand.

(1) Lower the jack until it is free of the jack pad. Remove the jack from under the helicopter.

(2) Install the wheel chocks and set the parking brake.

c. Jack the forward end of the helicopter at both forward landing gear jack pads as follows:

(1) If the helicopter is to be jacked while the wind is blowing, make sure the aft wheels are aligned and swivel locks are locked.

CAUTION

Do not restrain the rolling movement of the wheels. The wheels must roll to compensate for changes in helicopter attitude.

(2) Remove the wheel chocks and release the parking brake.

(3) Position a jack A-5 or equivalent at each forward landing gear jack pad (2).

(4) Raise the jacks just enough to absorb some of the helicopter weight.

(5) Jack the helicopter to the desired height by raising both jacks evenly and simultaneously.

d. Lower the front of the helicopter at the forward landing gear jack pads as follows:

CAUTION

Make sure the blades will not be damaged by striking an obstruction.

(1) Lower the jacks evenly and simultaneously until they are clear of the jack pads.

(2) Remove the jacks from beneath the helicopter.

(3) Install the chocks and set the parkig brake.

1-79. Jacking at the Aft Fuselage Jack Pads. (See fig. 1-29.)

NOTE

The maximum gross weight for jacking at the aft fuselage jack points is 46,000 pounds.

CAUTION

Make sure the rotary-wing blades will not be damaged by striking an obstruction.

a. Jack a single aft landing gear as follows:

CAUTION

Do not restrain movement of the forward wheels. The wheel must move to compensate for changes in helicopter attitude.

(1) Remove the chocks and release the parking brake.

(2) Engage static lock (4) on the aft landing gear strut.

(3) Position a jack 1214-151 or equivalent at an aft fuselage jack pad (1). Jack to the required height.

b. Lower a single aft landing gear as follows:

CAUTION

Make sure the ramp will not strike the ground when lowering the landing gear. Make sure the blades will not be damaged by striking an obstruction.

(1) Lower the jack until it is free of the helicopter.

(2) Remove the jack from beneath the helicopter.

CAUTION

Make sure the static lock is secured in the stowed position after the helicopter is lowered. Damage to the landing gear can result if the strut remains locked.

(3) Disengage the static lock. Secure it in the stowed position.

(4) Install the chocks and set the parking brake.

c. Jack the aft end of the helicopter at the aft fuselage jack pads as follows:

CAUTION

Make sure the rotary-wing blades will not be damaged by striking an obstruction. To avoid fuselage damage, do not jack the aft end of the helicopter when wind or gust velocity exceeds 20 knots.

(1) Position a jack at each aft fuselage jack pad. Raise the jacks enough to absorb some of the helicopter weight.

(2) Jack the helicopter to the required height by raising both jacks evenly and simultaneously.

d. Lower the aft end of the helicopter as follows:

CAUTION

Make sure the cargo ramp does not strike the ground when the helicopter is lowered. Make sure the blades will not be damaged by striking an obstruction. Make sure the aft fuselage is lowered evenly so the weight of the helicopter is distributed equally to the aft gear. This will prevent possible damage to the static lock, shock strut, and drag links.

(1) Lower both jacks evenly and simultaneously until they are free of the fuselage jack pads.

(2) Remove the jacks from beneath the helicopter.

CAUTION

Make sure the static locks are secured in the stowed position after the helicopter is lowered. Damage to the landing gear can result if the struts remain locked.

(3) Disengage the static locks on the aft landing gear. Secure them in the stowed position.

(4) Install the chocks and set the parking brake.

1-79.1 Jacking Entire Helicopter. (See fig. 1-29.)

CAUTION

To avoid damage to fuselage, do not jack the helicopter when wind or gust velocity exceeds 20 knots. Do not jack the helicopter at the forward fuselage jack pad if helicopter gross weight and center of gravity loading exceed the limits shown by the graph in fig. 1-29. Before jacking, make sure the blades will not be damaged by striking an obstruction. Make sure the cargo ramp will clear the ground during all phases of jacking.

a. Jack the entire helicopter as follows:

(1) Remove the chocks and release the parking brake.

CAUTION

The forward fuselage jack pad is restricted as shown by the graph in fig 1-29. If center of gravity and gross weight exceed those limits, equipment and fuel must be removed from the helicopter before jacking. Otherwise, damage to the helicopter structure can result. If the limits cannot be met, jack the forward end of the helicotper at forward landing gear jack pads.

(2) Position a jack 1214-151 or equivalent under forward fuselage jack pad (3). Raise the jack enough to absorb some of the helicopter weight.

(3) Deflate and collapse the forward landing gear shock struts.

(4) Engage static locks (4) on each aft landing gear strut.

(5) Position a jack at each aft fuselage jack pad (1). Raise the jacks enough to absorb some of the helicopter weight.

(6) Jack the helicopter to the desired height by raising all jacks evenly and simultaneously.

b. Lower the entire helicopter as follows:

CAUTION

Make sure the cargo ramp will not strike the ground when the helicopter is lowered. Make sure the blades will not be damaged by striking an obstruction. Make sure the aft fuselage is lowered evenly and simultaneously so the weight of the helicopter is distributed equally to the aft gear. This will prevent possible damage to the static lock, shock strut, and drag links.

(1) Lower all jacks evenly and simultaneously until they are free of the fuselage jack pads.

(2) Remove the jacks from beneath the helicopter.

CAUTION

Make sure the static locks are secured in the stowed position after the helicopter is lowered. Damage to the landing gear can result if the struts remain locked.

(3) Disengage the static locks on the aft landing gear. Secure them in the stowed position.

(4) Install the aft chocks and set the parking brake.

(5) Remove the ropes and inflate the forward landing gear shock struts.

1-80. Leveling (AVIM).

The helicopter must be leveled before it is weighed to determine weight and balance as outlined in TM 55-405-9. There are two leveling procedures, depending on whether the helicopter is raised on three or four jacks.

1-81. Three-Point Leveling (AVIM). Level the helicopter for three-point weighing as follows:

a. Perform primary leveling as follows:

NOTE

The leveling devices are located in the forward right-hand side entrance door opening. The plumb bob target is located on the floor between the door sill and the door aft hinge fitting. The plumb bob suspension fitting is located directly over the target on the flange of the upper door coaming.

(1) Deleted.

(2) Release all brakes.

(3) To decrease the angle between the plumb bob and target, deflate the forward landing gear shock struts. Inflate the aft landing gear shock struts. (Refer to para 1-19.)

(4) Lash a rope around the forward landing gear shock struts so that they will not extend when the helicopter is raised.

CAUTION

Do not restrain the movement of the aft wheels. Allowing the wheels to move will compensate for change in helicopter attitude.

b. Level the helicopter at the forward jack point as follows:

(1) Place an electronic weighing cell on a tripod jack and position the jack under the forward fuselage jack point.

(2) Raise the threaded jack extension by hand until the weighing cell engages the jack point.

c. Level the helicopter at the aft jack points as follows:

(1) Place an electronic weighing cell, on each of two jacks.

(2) Put the jacks under the left and right fuselage jack points.

(3) Raise each threaded jack extension by hand until the weighing cell engages the jack point.

(4) Raise both jacks together about 1 inch until the helicopter is level.

CAUTION

Do not lower the aft jacks first when weighing is completed.

d. When weighing is completed, lower all jacks together until the forward weighing cell is free of the forward jack point.

e. Lower the jacks at the aft landing gear. Remove the rigging tools and safety blocks.

1-82. Four-Point Leveling (AVIM). Level the helicopter for four-point weighing as follows:

a. Perform primary leveling. (Refer to para 1-81, step a.)

b. Level the helicopter at the aft jack points. (Refer to para 1-81, step c.)

CAUTION

Do not restrain the movement of forward wheels while jacking the aft fuselage. Movement of wheels compensates for the change in the helicopter's attitude.

c. Level the helicopter at the forward jack point as follows:

(1) Place one electronic weighing cell on each of two hydraulic hand jacks. Place the jacks under the forward landing gear jack points.

(2) Raise the threaded jack extension by hand until weighing cells engage jack points.

d. Raise all four jacks together about 4 inches until all tires clear the ground.

e. Adjust each jack as necessary to accurately level the helicopter.

CAUTION

Do not lower aft jacks first when weighing is completed.

f. When weighing is completed, lower the helicopter in the manner of para 1-81, steps d. and e.

1-83. Parking.

Park the helicopter as follows:

NOTE

First make sure fuel tanks are serviced to full. (Refer to para 1-2.)

a. Apply the wheel brakes. Set parking brakes.

b. Place chocks against the front and back of the forward and aft tires.

WARNING

Blade forces imposed on the swashplate can change direction as the blades turn and swing within their lead-lag range. Injury to personnel or damage to equipment can occur if the blades move unexpectedly.

CAUTION

Failure to position blades properly or install safety blocks may allow a blade to hit the fuselage. This may damage the fuselage and blade.

c. Turn the rotary-wing blades so that one aft blade is 30° off the fuselage centerline.

(1) Apply ac and hydraulic power. (Refer to para 1-97.)

(2) Open forward and aft fairings and work platforms.

(3) Center the control stick and the directional control pedals. Press the THRUST CONT BRAKE TRIGGER. Raise the thrust control lever to about its midtravel position.

(4) Position a safety block around one piston of each pivoting and swiveling cylinder. Retain the block in place with the latch provided on the block.

(5) Press the THRUST CONT BRAKE TRIGGER. Slowly lower the thrust control lever until the upper movable portions of each pivoting and swiveling cylinder rest on the safety blocks.

(6) Remove ac and hydraulic power.

d. When safety blocks are used, make sure REMOVE BEFORE FLIGHT streamers are attached to them. Mark a red X in the DA Form 2408-13.

e. Depressurize the hydraulic system by turning the manual control valve handle to FILLING, then NORMAL.

f. Unplug the battery.

g. Lock all doors and hatches.

h. Moor the helicopter if necessary. (Refer to para 1-84.)

1-84. Mooring.

(See fig. 1-30.) The helicopter can be secured with tiedown lines 114E5060-1 or equivalent to permanent fittings at hardstands or to fittings of mooring kit AN8015-2 in unpaved areas. The methods of mooring vary with intensity of winds. Table 1-8 provides necessary precautions to be taken pertaining to these conditions.

a. Park the helicopter. (Refer to para 1-83.) If mooring the helicopter to a hardstand, position the helicopter so tiedown fittings (3 and 4) are close to a mooring fitting (5).

b. Working from the walkway on top of the fuselage, insert the blade interlock of blade anchor assembly (1) into the anchor fitting at the tip of the nearest blade.

c. Use the tiedown line of the installed blade anchor assembly to pull the next blade into position so that its blade anchor assembly can be installed.

d. Repeat steps b. and c. until a blade anchor assembly is installed in each blade.

e. Position the blades so that one blade of one rotor extends perpendicularly from the left side of the helicopter and one blade of the other rotor extends perpendicularly from the right side of the helicopter.

f. Secure each of the blades to the tiedown fittings of the helicopter with the lines from the blade anchor assemblies.

g. Secure the helicopter with lines from the mooring fittings on the landing gear to the nearest mooring fittings on the hardstand. If the helicopter is to be tied down in an unpaved area, use mooring kit AN8015-2. If the kit is used, secure the two foremost and two aftermost blades to the tiedown fittings of the kit instead of to the landing gear fittings.

h. Install protective covers shown in fig. 1-31.

i. Release the blade anchor by pulling release lanyard (2, fig. 1-30) of the anchor assembly.

Table 1-8. High Wind Mooring

WIND VELOCITY	TIEDOWN REQUIREMENT
0 to 39 kts	M No tiedown requirement[1] F Tiedown FWD blades.
39 to 65 kts	Fuselage and blades tied down or fuselage tied down and blades folded
Over 65 kts	Evacuate helicopter from the area or store helicopter in hangar[2]

[1] Tie down blades on parked helicopters if they will be in rotor wash of other helicopters.

[2] If evacuation or storage is not possible, remove blades and tie fuselage down. A location in the lee of a large building is preferred.

1-85. Static Grounding During Ground Operation.

Electrostatically ground all helicopters parked on the flight line, in hangars, or on the apron and helicopters undergoing maintenance or painting as follows:

a. Immediately after the helicopter is positioned, connect one end of an approved grounding cable to the helicopter landing gear aft axle sleeve (item 24 or 26, fig. 3-21).

b. Make sure that cable is free of broken strands. Make sure that clips or plugs are securely attached to grounding points.

c. Attach red cloth strips to the cable for the safety of personnel.

d. When disconnecting the ground cable, make sure the ground rod end is disconnected first.

1-86. Grounding During Fueling or Defueling.

When fueling or defueling the helicopter, observe the following electrostatic grounding procedures:

a. Make sure the required ground cable is connected. (Refer to para 1-85.)

b. Connect a ground cable from the servicing unit to the grounding rod used by the helicopter.

c. Connect ground cable from helicopter aft landing gear axle sleeve (item 24, fig. 3-21) to the servicing unit.

d. Connect a static ground cable plug from the fuel hose nozzle to the grounding jack directly above the fuel tank filler to be serviced.

e. Touch the nozzle to the helicopter before opening fuel cell cap. At completion of fueling, close the fuel cell cap before removing the ground connection.

f. Disconnect the ground cable connecting the helicopter and servicing unit. Make sure that the servicing unit end is disconnected first.

g. Disconnect the servicing unit ground cable from the ground rod. Make sure that the ground rod end is disconnected first.

h. If the helicopter is to be moved, disconnect the ground cable. (Refer to para 1-85.)

1-87. Protective Covers.

(See fig. 1-31.) The following protective covers shall be stowed under troop seat opposite forward door of helicopter. They are used as necessary whenever helicopter is parked or moored.

a. Engine (left) inlet cover 114G1206-1 or 114G1244-2. Helicopters equipped with engine air inlet standard screens use cover 114G1244-2. Helicopters not equipped with screens may use either cover.

b. Engine (right) inlet cover 114G1206-1 or 114G1244-3. Helicopters equipped with engine air inlet standard screens use cover 114G1244-3. Helicopters not equipped with screens may use either cover.

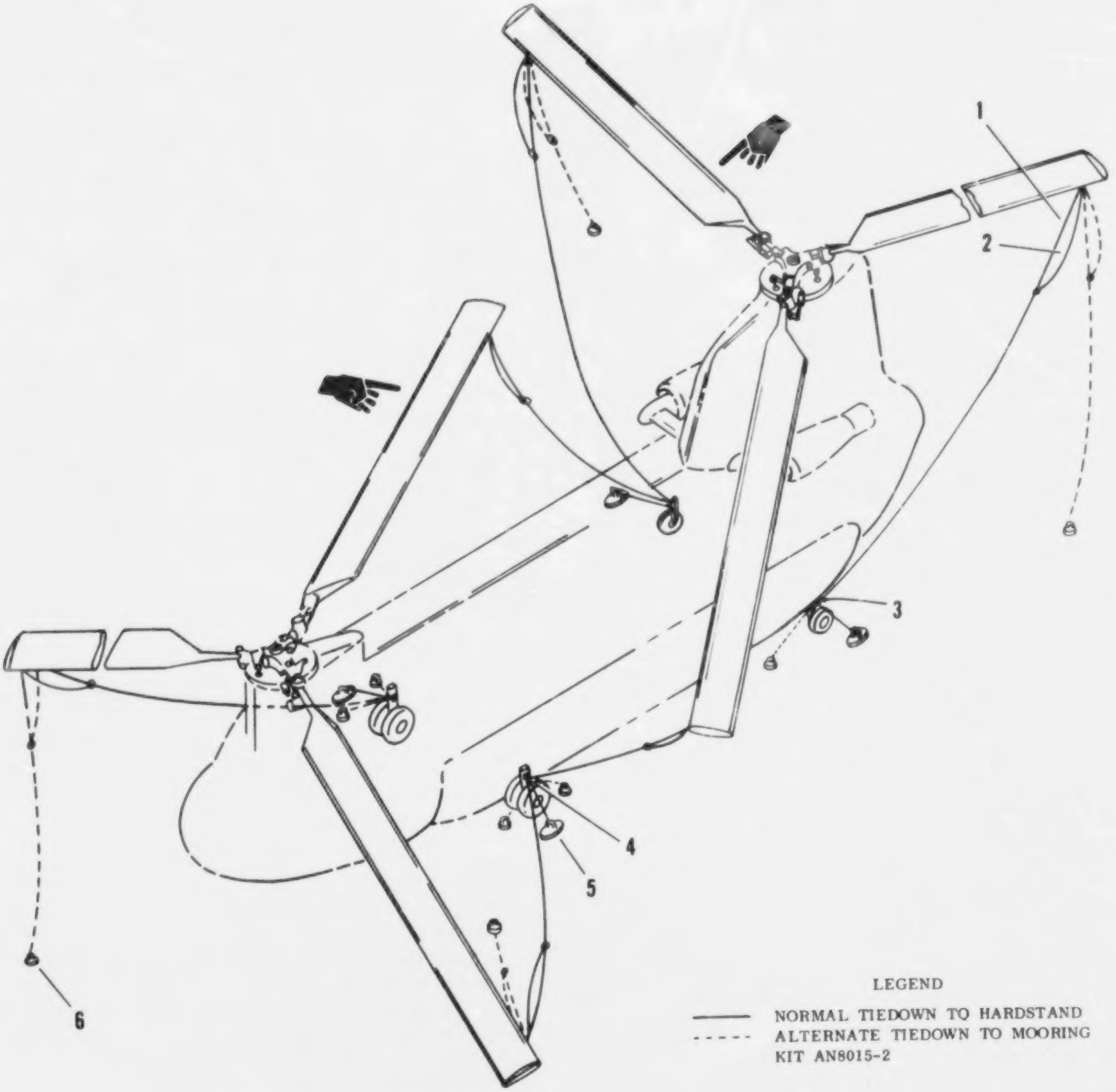
c. Engine outlet cover 114E5042-1 or 114G1323-1 (2 ea). Helicopters equipped with T55-L-11A engines use cover 114G1323-1. All other helicopters use cover 114E5042-1.

d. Oil cooler inlet cover 114E5061-1.

e. Pitot tube cover 114E5040-3 (H.4, I, J.1 and J.2) or 114E5040-33 (J.3 and subq).

f. Apu exhaust cover A02E5828-5.

g. Cockpit enclosure protective cover 114G1022-1 or 114G1238-21.


1
2
3
4
5
6
LEGEND
—— NORMAL TIEDOWN TO HARDSTAND
- - - - ALTERNATE TIEDOWN TO MOORING KIT AN8015-2

B114-235-20

1. Blade anchor assembly
2. Blade anchor release lanyard
3. Helicopter aft tiedown fitting
4. Helicopter forward tiedown fitting
5. Hardstand mooring fitting
6. Mooring kit tiedown fitting

Figure 1-30. Mooring the Helicopter

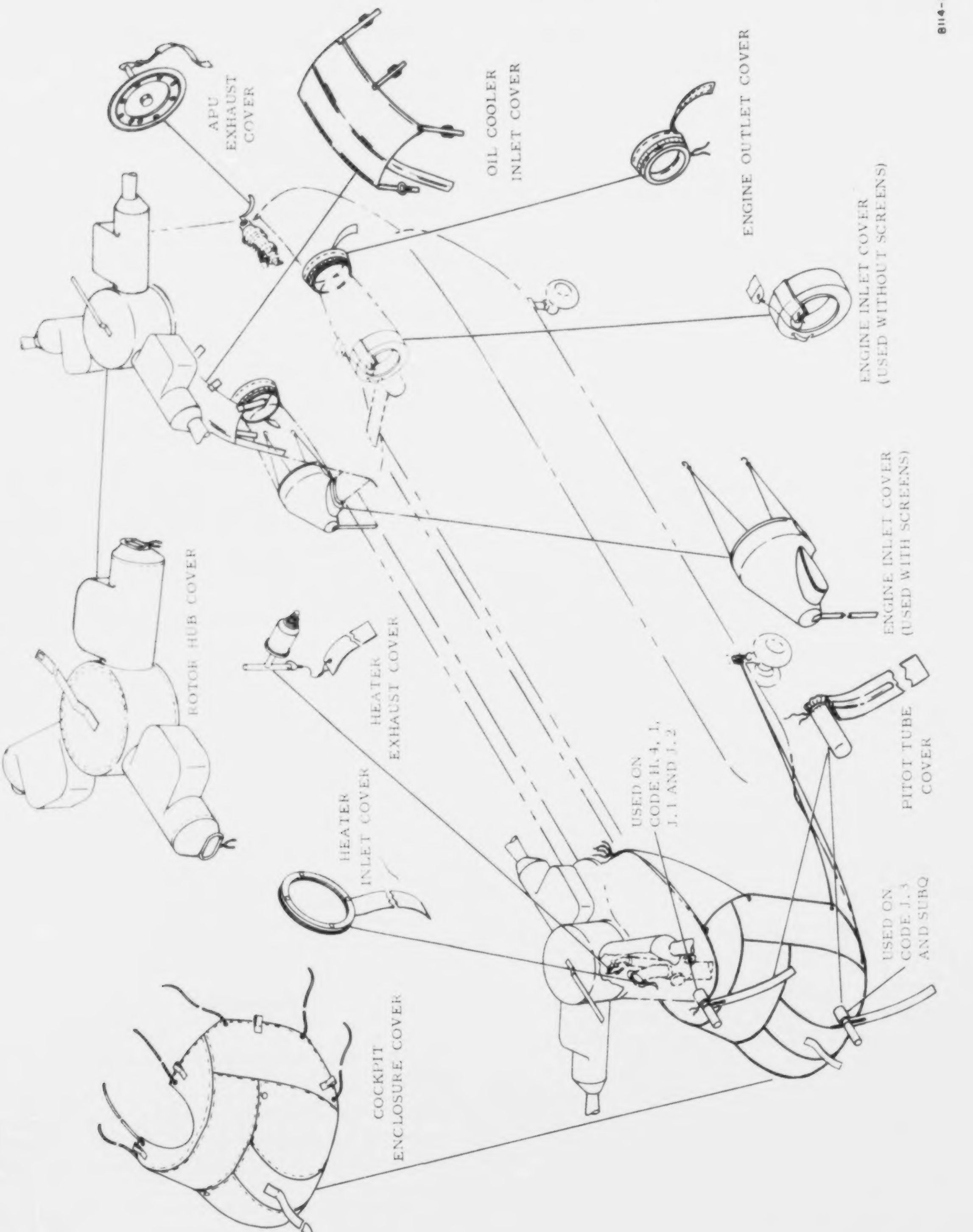

8114-236-20U
APU EXHAUST COVER
OIL COOLER INLET COVER
ENGINE OUTLET COVER
ENGINE INLET COVER (USED WITHOUT SCREENS)
ENGINE INLET COVER (USED WITH SCREENS)
ROTOR HUB COVER
HEATER EXHAUST COVER
HEATER INLET COVER
USED ON CODE H.4, I, J.1 AND J.2
PITOT TUBE COVER
USED ON CODE J.3 AND SUBQ
COCKPIT ENCLOSURE COVER
54x39

Figure 1-31. Protective Covers

h. Rotor hub protective cover 114G1023-16 (2 ea).

i. Heater exhaust protective cover 114G1025-1.

j. Heater opening inlet cover 114G1024-1.

1-88. Hoisting (AVIM).

(See fig. 1-32.) Hoist preserved and covered helicopters or helicopters with gross weights of 20,000 to 33,000 pounds as follows:

CAUTION

It is essential to remove the blades. If the helicopter is hoisted with the blades installed, they may turn and twist off the hoisting cables or chains, or unscrew the fittings. The helicopter will drop and damage to equipment will result.

a. If rotary-wing blades are installed, remove them and stow them inside the helicopter. (Refer to para 5-95.)

b. Remove nut and bolt (3) from each fitting (6) on sling. Detach fittings from chains.

CAUTION

Do not lean a ladder against the fuselage. Do not walk on the fuselage. Work platforms are not accessible when the helicopter is covered and the structure adjacent to rotor heads can not support the weight of personnel or equipment. With covered helicopters, use a suitable workstand, A-ladder, fork-lift truck, or similar equipment. If the helicopter is not covered, use work platforms.

c. Position a suitable A-ladder or workstand near each rotor head.

d. If the tiedown fittings are installed, remove them from the rotor shafts.

e. If helicopter is equipped with rotor shafts having 4$\frac{7}{16}$ inch ID, remove protective cover from handling sling adapter 143G1006-47. Keep adapter and fitting (6) screwed together. If the helicopter is equipped with rotor shafts having a 4-inch ID, remove the adapter and protective cover from the fitting. Store the adapter and its protective cover in a safe place.

CAUTION

Failure to remove burrs or foreign matter may cause the fittings to stop before they bottom. If at least eight threads are not engaged, the helicopter may drop when hoisted.

f. Inspect the threads of fitting or adapter and of rotor shafts for damage or foreign matter. Remove all burrs and foreign matter. Lubricate fittings with antiseize compound (C63).

g. Screw fittings into rotor shafts until they bottom.

h. Attach handling sling 143G1006-36 (1) at eye weldment (2) to a suitable hoist.

i. Attach guide lines to the sling. Maneuver the sling over the helicopter until forward (4) and aft (5) sling attachments are over respective rotor shafts.

NOTE

The forward attachment chain has nine links. The aft attachment chain has three links. This link arrangement results in a 6° nose-up attitude when the helicopter is lifted off the ground. With this arrangement, the helicopter should be balanced in the air. If it is not, rebalancing will be necessary prior to hoisting.

CAUTION

Make certain that threads of each fitting or adapter are sufficiently engaged in rotor shafts before attempting to hoist helicopter. Do not back off fittings or adapters more than 90°.

j. Rotate rotor shafts until bolts (3) are perpendicular to the longitudinal axis of the helicopter and until there are no kinks in chains. Back off fittings only as last resort.

k. Install bolts and nuts (3). Tighten nuts securely.

WARNING

Personnel shall remain clear of area beneath helicopter.

l. Attach a guide line to each forward and aft landing gear tiedown fitting; four guide lines in all. Assign as many men as are needed to each line to control helicopter during hoisting.

m. Take up slack in the chains with the hoist. Check for interference or kinks.

CAUTION

Use a crane capable of lifting 33,000 pounds.

n. Hoist the helicopter off the ground slowly and carefully. Stop as soon as the helicopter has cleared the ground. Check for balance and stability. Lower and balance the load, if necessary. Balance the helicopter by placing ballast inside the cabin.

o. Slowly hoist and transfer the helicopter to the desired location. Operate the hoist cautiously and smoothly. Avoid sudden starts, stops, drops, or abrupt hoist maneuvers. Such actions could cause the helicopter to swing or oscillate.

WARNING

Personnel shall remain clear of area beneath helicopter.

p. Before lowering helicopter, make certain that the area on which the helicopter is to rest has sufficient strength to support its weight. Make certain that all

---

Legend for figure 1-32

1.	Sling assembly	5.	Aft attachment
2.	Eye weldment	6.	Fitting
3.	Bolt and nut	7.	Adapter
4.	Forward attachment	8.	Protective cover

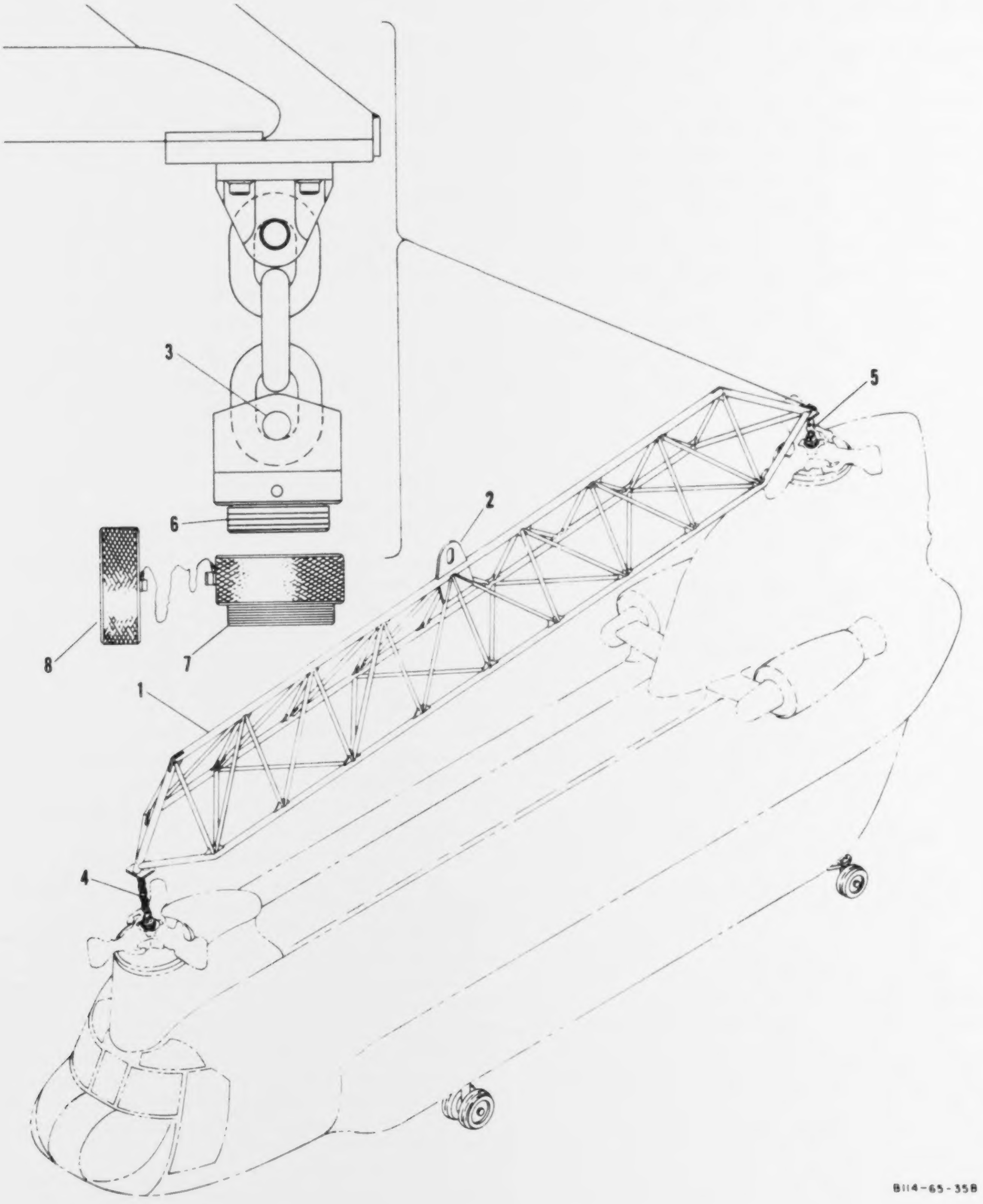

3
6
8
7
1
2
5
4
B114-65-358

Figure 1-32. Hoisting the Helicopter (Gross Weight of 20,000 to 33,000 Pounds)

maintenance and support equipment which could damage the helicopter is removed from under it.

q. Lower the helicopter slowly until all weight is on landing gears. This will be indicated by slack in both chains.

r. Position a suitable ladder or workstand near each rotor head.

s. Remove bolt and nut (3) from each fitting (6).

t. Move the sling out of the way with the hoist.

u. Remove fittings and adapters, if installed, from rotor shafts. Attach them to the sling with bolts and nuts (3). If no further hoisting is to be done, install protective covers on threads of both adapters. If adapters (7) were not used during hoisting, screw them on the fittings.

v. If required, install the rotary-wing blades. (Refer to para 5-111.)

w. Remove the guide lines from the forward and the aft landing gear tiedown fittings.

1-88.1. Hoisting — 33,000 Pounds. (See fig. 1-32.1.)

Hoist a helicopter with gross weight up to 33,000 pounds with sling cables as follows:

a. If rotary-wing blades are installed, remove them and stow them inside the helicopter. (Refer to para 5-95.)

b. Defuel the fuel tanks. Refer to para 10-127 (CH-47B) or 10-247 (CH-47C).

c. Install a ring assembly 114E5909-8 on each rotary-wing head as follows:

(1) Remove screws (1) and washers (2) from retainer (3). Remove retainer and cover (4).

WARNING

Make sure ring is fully seated in shaft. Otherwise, injury to personnel or loss of helicopter could result.

(2) Remove cover (6) from ring (5). Install ring in rotor shaft.

d. Attach a cable (7) at least 93 feet long to the ring (5) on each rotor head.

WARNING

Guide lines must be long enough to let personnel keep clear of area under helicopter during hoisting.

e. Attach guide lines (8) to landing gear shackles (9) and (10). Have helpers hold lines.

f. Attach two cables (7) to a suitable hoist. Slowly take up cable slack with hoist.

g. Slowly raise helicopter from ground. Hold it steady with guide lines (8).

h. Move helicopter slowly to desired location. Avoid sudden motions that could start it swinging.

i. Check that area where helicopter will be lowered is clear of obstructions.

j. Lower helicopter slowly until all weight is on landing gear, and cables (7) are slack. Remove cables from hoist and rings (5). Remove guide lines (8) from shackles (9) and (10).

k. Remove the ring assembly from each head as follows:

(1) Screw ring (5) out of rotor shaft. Install cover (6) on ring thread.

(2) Position cover (4) on oil tank. Position retainer (3) on cover.

(3) Install nine screws (1) and washers (2). Torque screws to 23 inch-pounds.

1-89. Sling Loading (AVIM).

(See fig. 1-33 and 1-34.) The helicopter can be hoisted (with the aft pylon installed or removed) with sling (T72) or 114E5049-1. Hoist the helicopter with the sling attached to the forward and aft attachment fittings on the fuselage. The forward attachment fittings are at sta 122.25 within the forward transmission fairing. The aft attachment fittings are at sta 475.31 within the pylon leading edge hinged fairing. Both slings are used with a crane capable of lifting a gross weight of 20,000 pounds.

CAUTION

Avoid excessive stress on the fuselage. Use the hoisting method in para 1-88 or 1-88.1 if the helicopter weighs more than 20,000 pounds.

a. Apply hydraulic power to one flight control system. (Refer to para 1-99.)

b. Open the forward transmission work platform and pylon leading edge hinged fairing.

c. Press the THRUST CONT BRAKE TRIGGER. Raise the thrust control halfway from the full DOWN position.

d. (See fig. 11-4.) Position an actuating cylinder safety block from set (T29) around one piston of each actuating cylinder. Secure each block latch.

e. Slowly move the thrust control down until the actuating cylinders are seated on the safety blocks.

f. Remove hydraulic power from the helicopter.

g. Before any hoisting operation, defuel fuel tanks. (Refer to para 10-127, 10-181, or 10-247.)

h. Remove all excess weight and loose equipment from the interior of the helicopter.

i. Remove and stow the rotary-wing blades inside the helicopter. (Refer to para 5-95.)

j. (See fig. 1-34.) disconnect rigid connecting link (1), and link assembly (3) from bellcrank (2) to prevent interference with sling leg (4). Tape loose components together. Use tape (C337). Install warning streamers on the link and link assembly as positive indication that these components are disconnected.

k. Attach proper sling leg fitting (6) to corresponding airframe attachment fitting (5) with quick-release pin (7). Lubricate quick-release pins (7) with air-drying solid-film lubricant (C210) prior to installation.

NOTE

The forward and aft leg fittings on both slings are marked FWD and AFT, respectively.

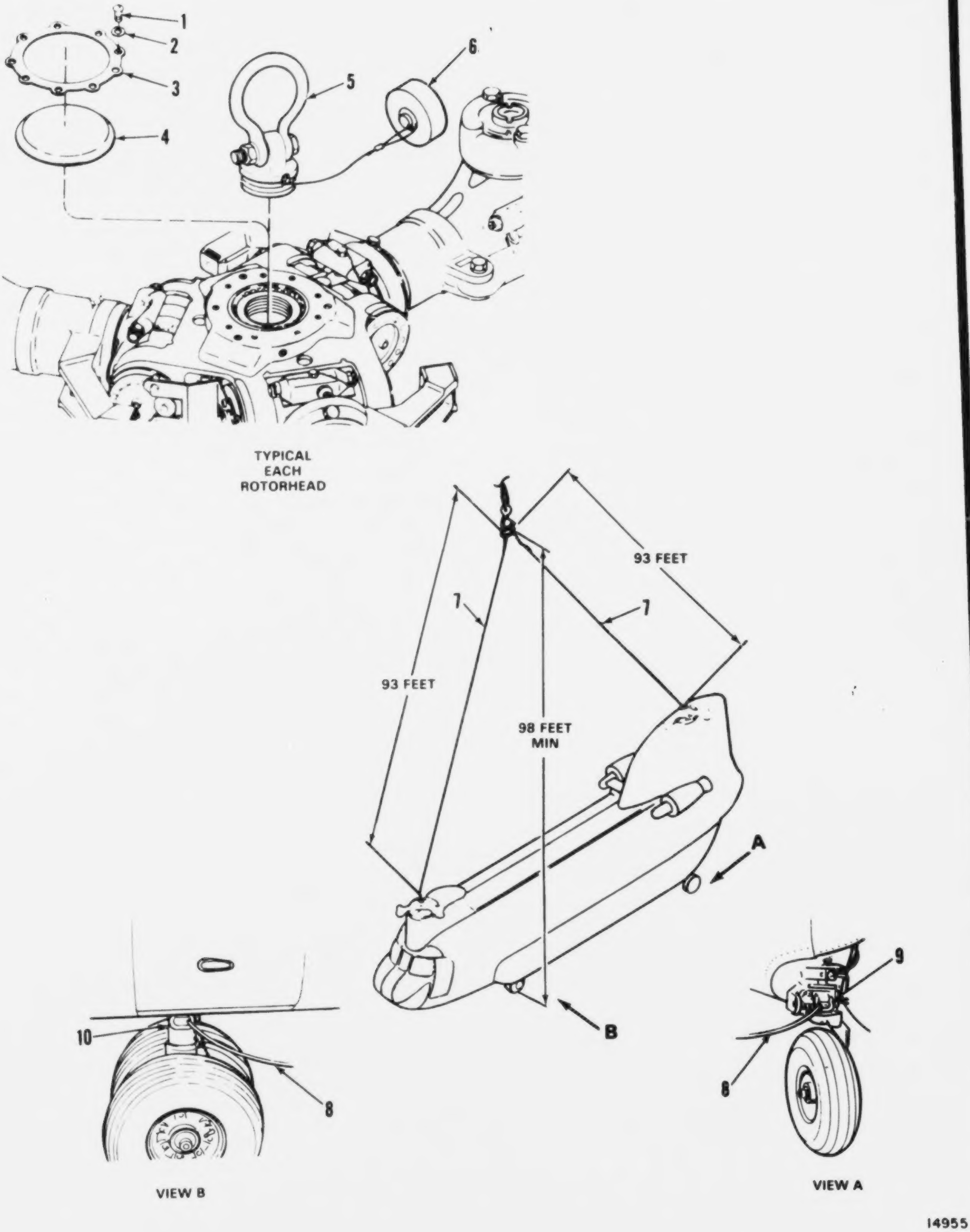

1
2
3
4
5
6
TYPICAL
EACH
ROTORHEAD
93 FEET
7
7
93 FEET
98 FEET
MIN
A
B
10
8
9
8
VIEW B
VIEW A
14955

Figure 1-32.1. Cable Hoisting — 33,000 Pound Weight

l. (See fig. 1-33.) If the aft pylon is installed, attach aft link assembly (2) to the crane hook. If the aft pylon has been removed, attach forward link assembly (1) to the crane hook.

WARNING

Personnel shall remain clear of the area beneath the helicopter.

m. Attach a guide line to one forward and one aft landing gear tiedown fitting. Assign a man to each guide line to control the helicopter during hoisting.

n. Slowly take up slack in the sling with the hoist. Check for interference or kinks in the link or cable assemblies.

o. Slowly hoist the helicopter off the ground. Stop the hoist as soon as the helicopter has cleared the ground. Check the load for balance and stability. Lower and rebalance load, if necessary, by placing ballast inside the helicopter.

p. Hoist and transfer the helicopter to the desired location. Operate the hoist cautiously and smoothly. Avoid sudden starts, stops, drops, or abrupt hoist maneuvers. Such actions could cause the helicopter to swing or oscillate.

WARNING

Personnel shall remain clear of the area beneath the helicopter.

q. Prior to lowering the helicopter, make certain that the area on which the helicopter is to rest is strong enough to support its weight. Make certain that area is cleared of maintenance and support equipment.

r. Slowly lower the helicopter until all weight is on both forward and aft landing gear. This will be indicated by slack in the sling (aft and forward cable assemblies, 3 and 4, fig. 1-33).

s. Remove link assembly (1 or 2) from the crane hook. Carefully lower the sling to the drive shaft tunnel cover level.

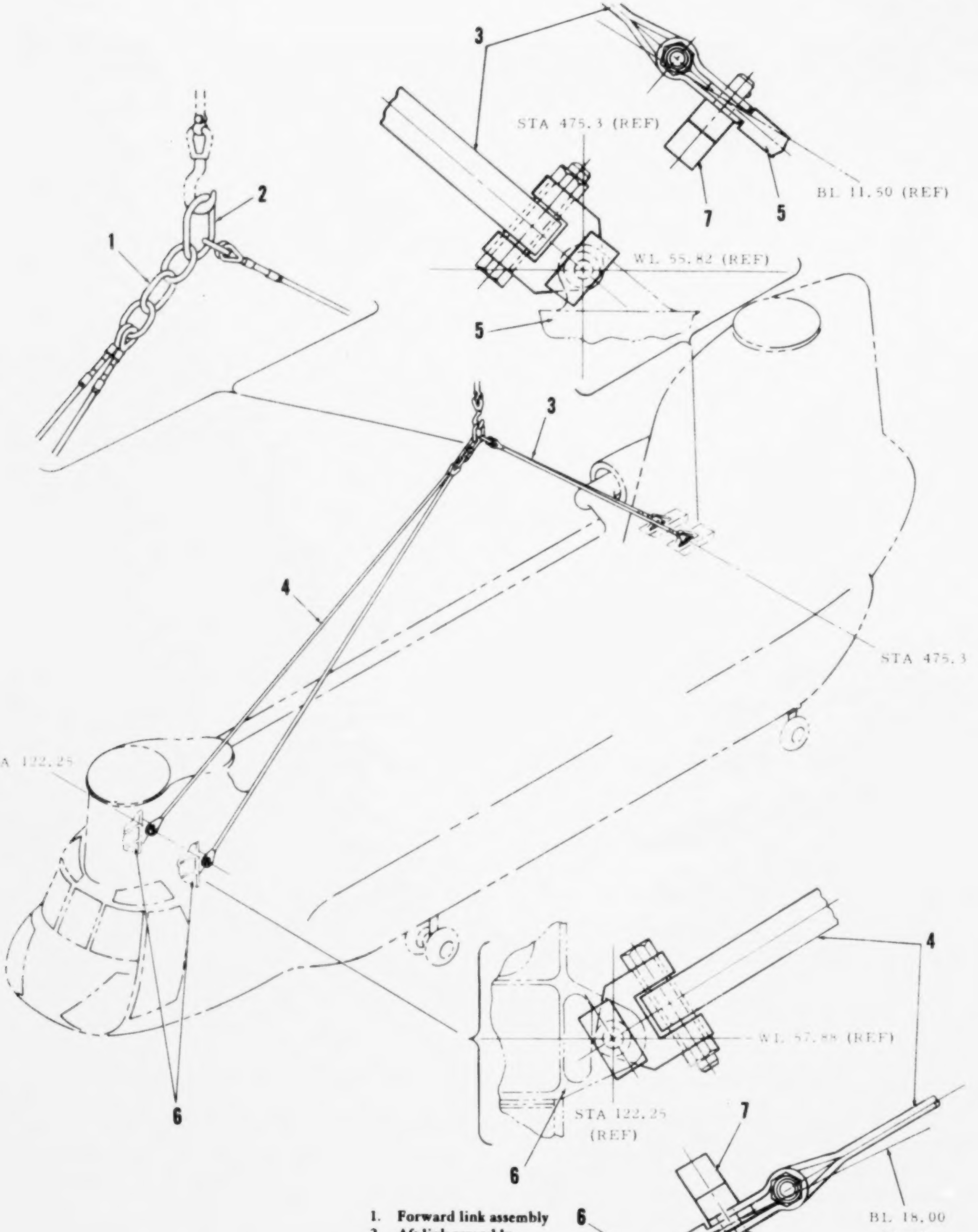
t. Remove quick-release pins (7, fig. 1-34). Remove the sling.

u. Remove the warning streamers. Connect rigid connecting link (1) and link assembly (3) to bellcrank (2).

CAUTION

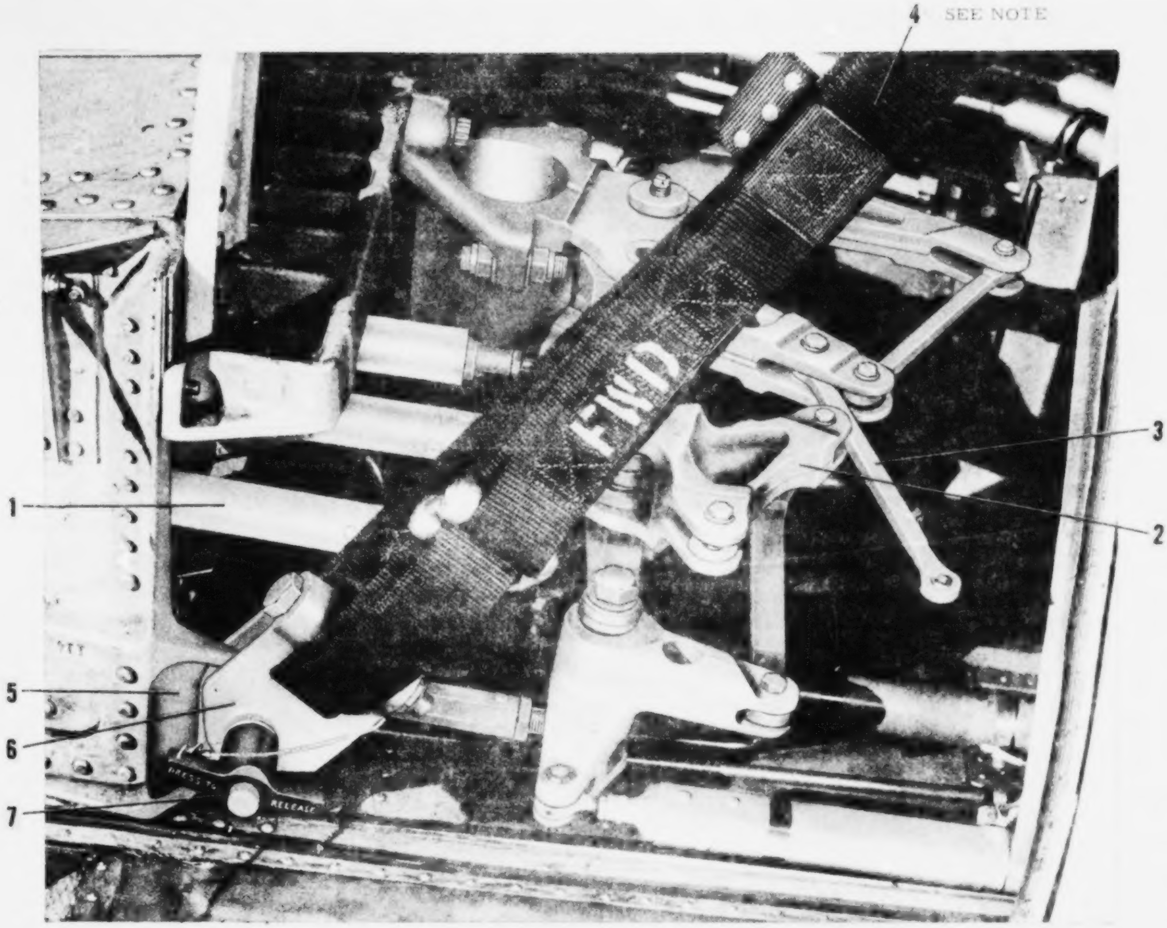
Connect the links before the hydraulic system is pressurized; otherwise, damage will result.

v. Apply hydraulic power to one flight control system. (Refer to para 1-99.)


3
STA 475.3 (REF)
BL 11.50 (REF)
7
5
2
1
WL 55.82 (REF)
5
3
4
STA 475.3
STA 122.25
4
WL 57.88 (REF)
STA 122.25 (REF)
6
7
6
6
BL 18.00 (REF)
42 x 54
B114-63-34N

1. **Forward link assembly**
2. **Aft link assembly**
3. **Aft cable assembly**
4. **Forward cable assembly**
5. **Aft attachment fitting**
6. **Forward attachment fitting**
7. **Quick-release pin**

Figure 1-33. Hoisting Method (Gross Weight of 20,000 Pounds)



NOTE

NYLON SLING SHOWN.
STEEL CABLE SLING USED
IN SAME MANNER

1. Rigid connecting link
2. Bellcrank
3. Link assembly
4. Sling leg (typical installation)
5. Attachment fitting
6. Sling leg fitting
7. Quick-release pin

Figure 1-34. Attachment for Hoisting of the Helicopter (Gross Weight 20,000 Pounds)

w. Raise the thrust control and remove safety blocks from the actuating cylinders. (See fig. 11-4.)

x. Remove hydraulic power from the helicopter.

y. Install the rotary-wing blades. (Refer to para 5-111.)

z. Close the forward pylon leading edge hinged fairing and forward transmission work platform.

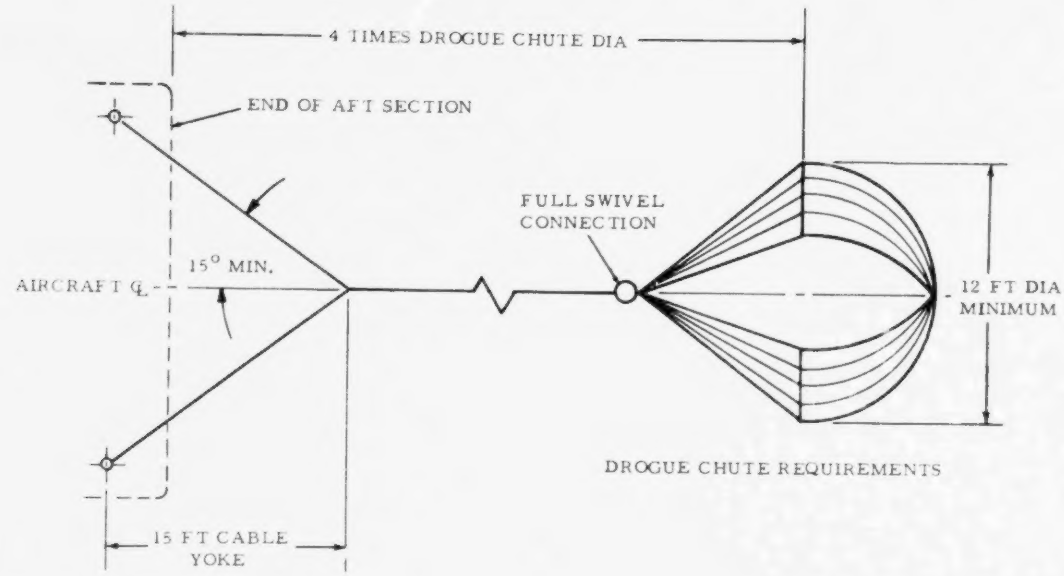
aa. Remove the guide lines from the forward and aft landing gear tiedown fittings. Remove the hoist and sling.

ab. Replace loose equipment and those items of excess weight removed prior to hoisting. (Refer to preceding step b.) Refuel the helicopter as required.

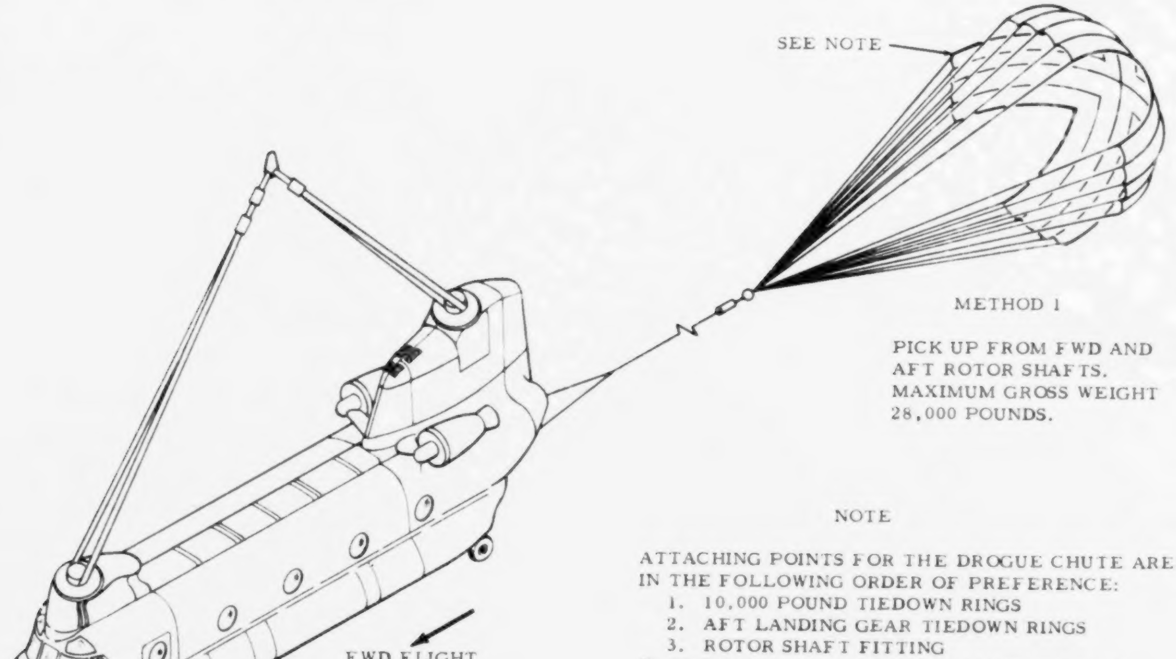
1-90. Helicopter Recovery (AVIM).

Recovery (sling loading) of a damaged helicopter is accomplished using a suitable flexible lifting sling and appropriate items of attaching hardware.

1-91. Sling Loading for Recovery (AVIM). Attaching points for lifting helicopter and attaching drogue chute vary, depending on nature and extent of airframe damage. Fig. 1-35 shows various methods of lifting the helicopter and attaching the drogue chute. It may be necessary to combine features of several lifting methods to suit a particular requirement.


4 TIMES DROGUE CHUTE DIA
END OF AFT SECTION
FULL SWIVEL CONNECTION
15° MIN.
AIRCRAFT ℄
12 FT DIA MINIMUM
15 FT CABLE YOKE

DROGUE CHUTE REQUIREMENTS


SEE NOTE
FWD FLIGHT

METHOD 1

PICK UP FROM FWD AND AFT ROTOR SHAFTS. MAXIMUM GROSS WEIGHT 28,000 POUNDS.

NOTE

ATTACHING POINTS FOR THE DROGUE CHUTE ARE IN THE FOLLOWING ORDER OF PREFERENCE:

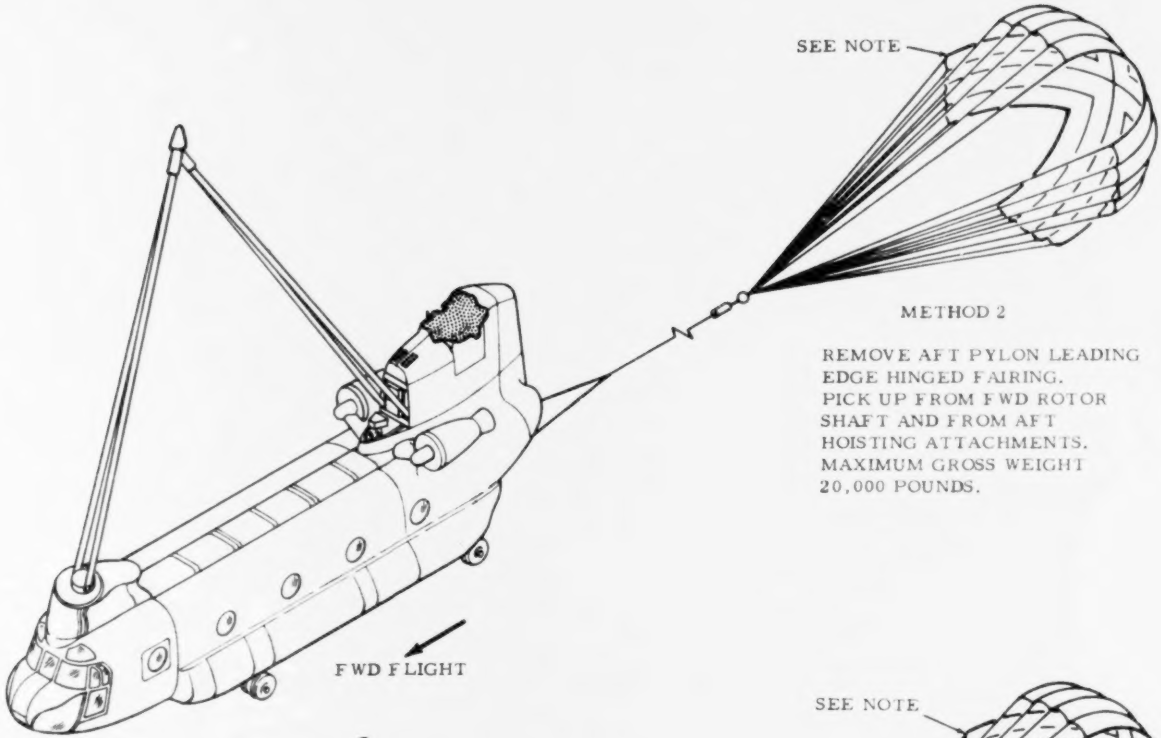
1. 10,000 POUND TIEDOWN RINGS
2. AFT LANDING GEAR TIEDOWN RINGS
3. ROTOR SHAFT FITTING

IF TIEDOWN RINGS ARE USED, MAKE SURE NO ROUGH FUSELAGE EDGES ARE IN A POSITION TO CHAFE THE DROGUE CHUTE LINES.

42x51

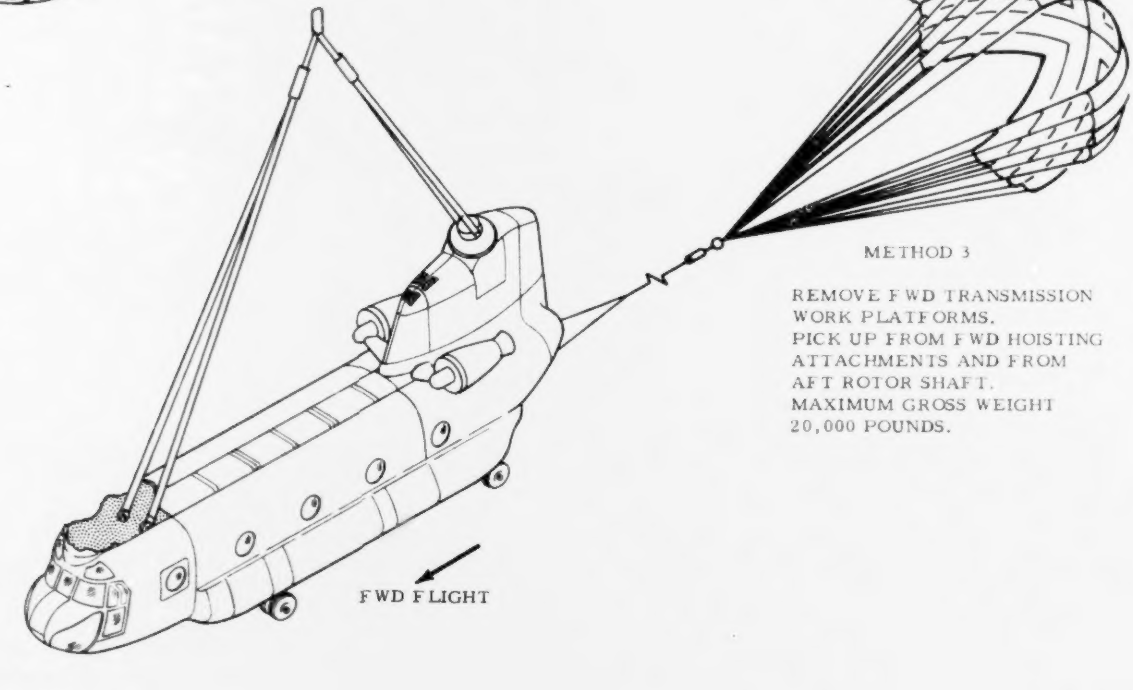
8114-707-20Q

Figure 1-35. Sling Loading for Recovery (Sheet 1 of 4)



METHOD 2

REMOVE AFT PYLON LEADING EDGE HINGED FAIRING.
PICK UP FROM FWD ROTOR SHAFT AND FROM AFT HOISTING ATTACHMENTS.
MAXIMUM GROSS WEIGHT 20,000 POUNDS.



METHOD 3

REMOVE FWD TRANSMISSION WORK PLATFORMS.
PICK UP FROM FWD HOISTING ATTACHMENTS AND FROM AFT ROTOR SHAFT.
MAXIMUM GROSS WEIGHT 20,000 POUNDS.

42x51

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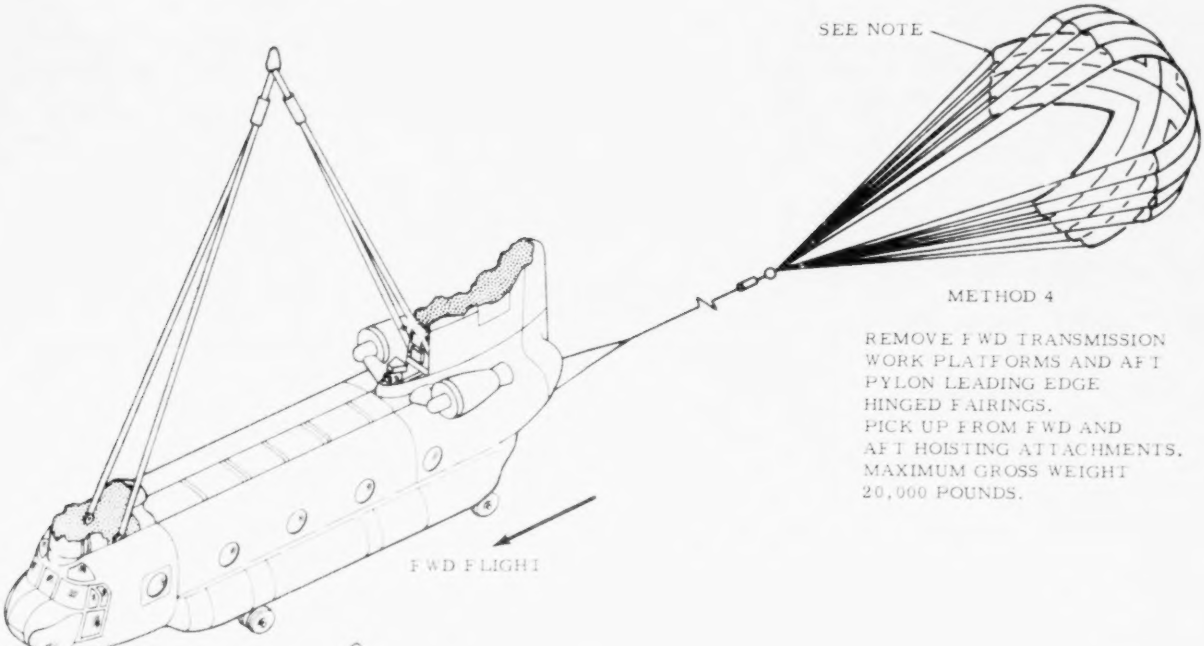
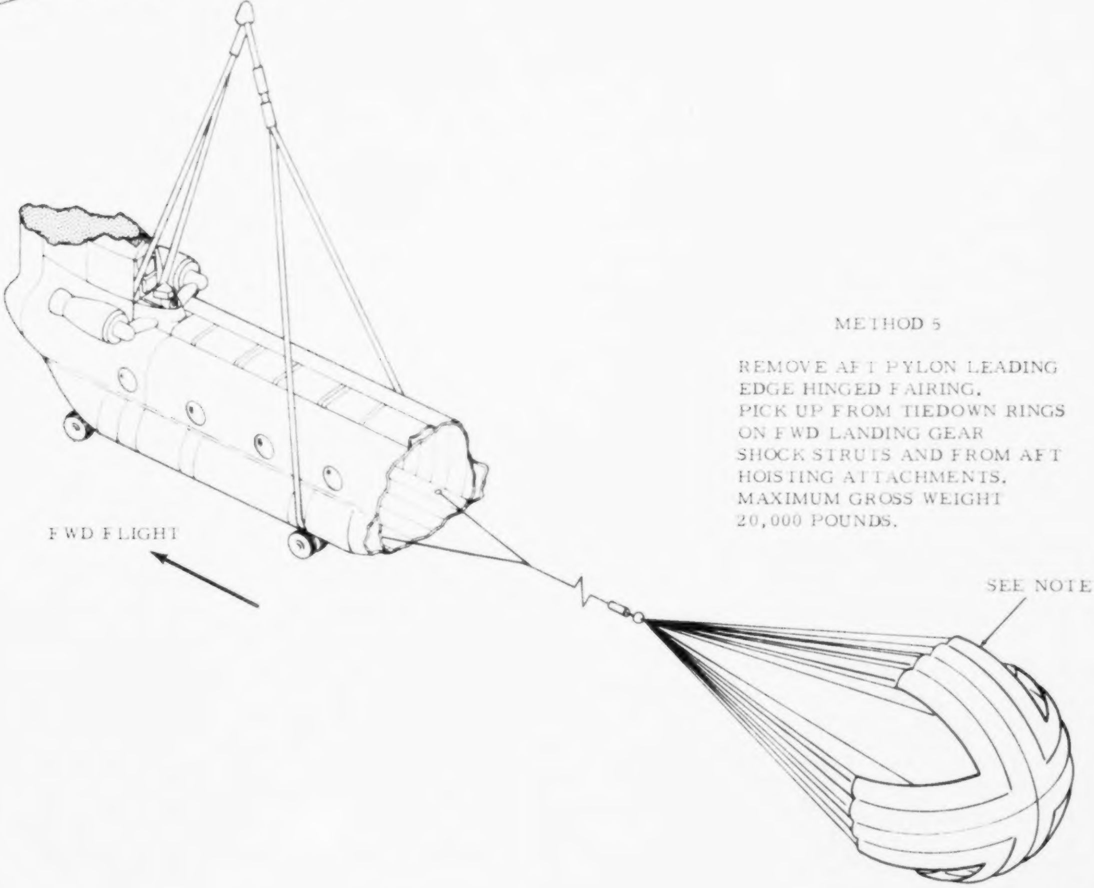
Figure 1-35. Sling Loading for Recovery (Sheet 2 of 4)



METHOD 4

REMOVE FWD TRANSMISSION WORK PLATFORMS AND AFT PYLON LEADING EDGE HINGED FAIRINGS.
PICK UP FROM FWD AND AFT HOISTING ATTACHMENTS.
MAXIMUM GROSS WEIGHT 20,000 POUNDS.



METHOD 5

REMOVE AFT PYLON LEADING EDGE HINGED FAIRING.
PICK UP FROM TIEDOWN RINGS ON FWD LANDING GEAR SHOCK STRUTS AND FROM AFT HOISTING ATTACHMENTS.
MAXIMUM GROSS WEIGHT 20,000 POUNDS.

42x54

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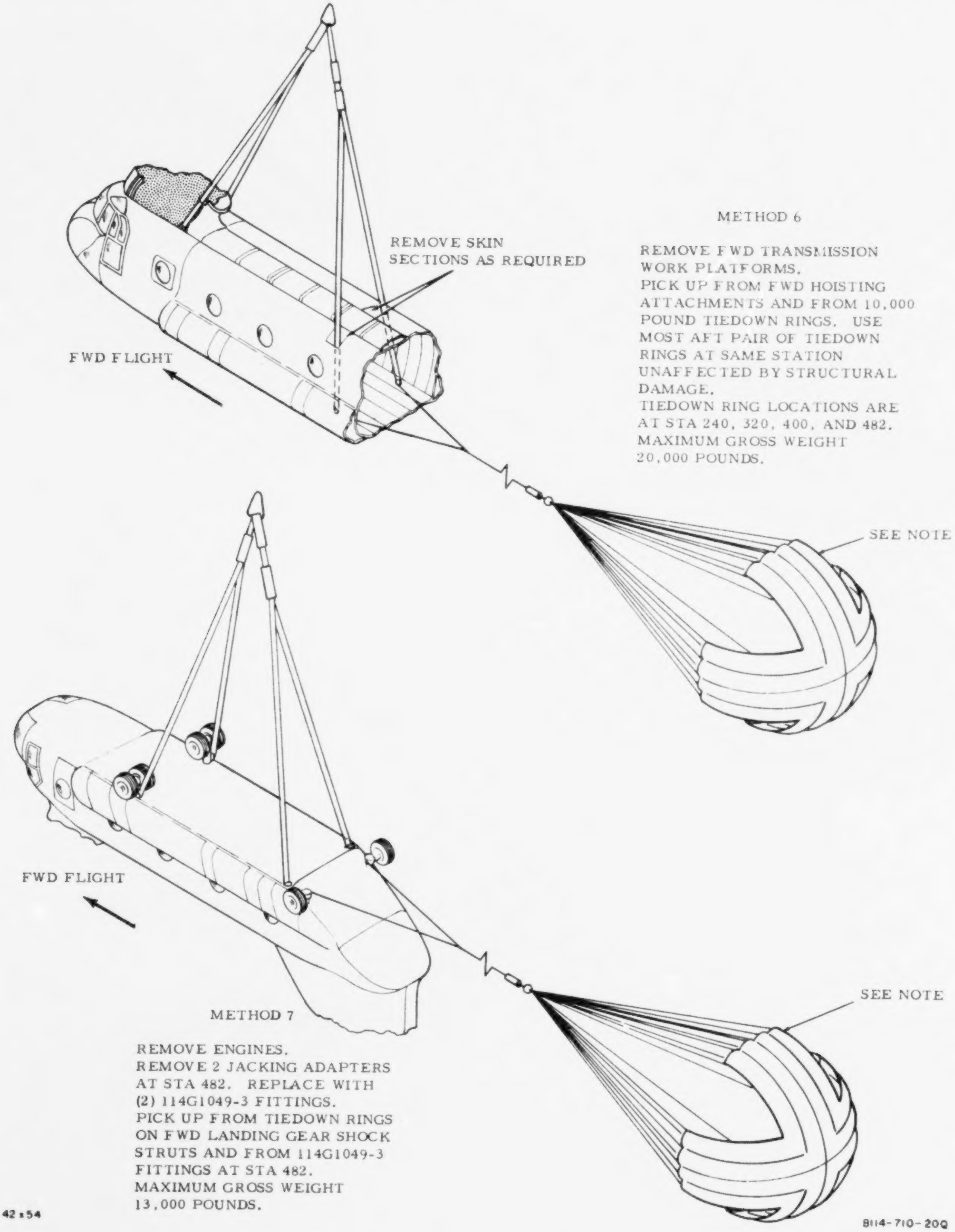
Figure 1-35. Sling Loading for Recovery (Sheet 3 of 4)


REMOVE SKIN SECTIONS AS REQUIRED
FWD FLIGHT
SEE NOTE
FWD FLIGHT
SEE NOTE
42x54
B114-710-20Q

METHOD 6

REMOVE FWD TRANSMISSION WORK PLATFORMS.
PICK UP FROM FWD HOISTING ATTACHMENTS AND FROM 10,000 POUND TIEDOWN RINGS. USE MOST AFT PAIR OF TIEDOWN RINGS AT SAME STATION UNAFFECTED BY STRUCTURAL DAMAGE.
TIEDOWN RING LOCATIONS ARE AT STA 240, 320, 400, AND 482.
MAXIMUM GROSS WEIGHT 20,000 POUNDS.

METHOD 7

REMOVE ENGINES.
REMOVE 2 JACKING ADAPTERS AT STA 482. REPLACE WITH (2) 114G1049-3 FITTINGS.
PICK UP FROM TIEDOWN RINGS ON FWD LANDING GEAR SHOCK STRUTS AND FROM 114G1049-3 FITTINGS AT STA 482.
MAXIMUM GROSS WEIGHT 13,000 POUNDS.

Figure 1-35. Sling Loading for Recovery (Sheet 4 of 4)

CAUTION

Do not sling-load the helicopter with a damaged open end forward.

a. Before fitting a recovery sling to the helicopter being recovered, do the following:

(1) Remove the rotor blades.

(2) Empty the fuel tanks. (Refer to para 10-127, 10-181, or 10-247.) Purge each main fuel tank with two 15-pound tanks of CO_2. (Refer to para 10-3, 10-39, or 10-65.)

(3) Inspect hoist points for structural soundness. Make sure the hoist points are clean.

b. Fit the recovery sling to the helicopter. Fasten the drogue chute to the trailing end of the helicopter. Attaching points for the drogue chute are in the following order of preference:

(1) 10,000 pound tiedown fittings.

(2) Aft landing gear tiedown rings.

(3) Rotor shaft fitting.

NOTE

When environment or terrain make fitting a drogue chute impractical, the helicopter may be carried slowly (not more than 30 knots) until an area is reached where a chute can be fitted.

c. Attach the drogue chute cable to the helicopter as shown in fig. 1-35.

NOTE

The drogue chute diameter should be at least twelve feet. The drogue chute cable should be at least 4 times the chute diameter.

d. Open the drogue chute by having a ground crew hold the unraveled chute and slowly pay it out as the sling-loaded helicopter leaves the recovery area.

NOTE

If it is impossible for the ground crew to remain in the recovery area, the drogue chute may be dropped from the ramp of the recovery helicopter provided a CH-47 is used for the recovery. Sufficient forward airspeed has to be achieved to assure proper opening of the chute.

e. Make sure that when the helicopter is hoisted, it does not assume a nose down attitude or a nose up attitude greater than about 15°. Do not carry the helicopter at speeds greater than 80 knots.

1-92. Landing of Sling-Loaded Helicopter (AVIM).

When slowing to land a sling-loaded helicopter, be careful that drogue chute does not become a hazard. Observe the following precautions:

a. Make sure the landing zone is clear of obstructions that could snag the chute.

b. Lower the sling-loaded helicopter as nearly vertical as possible.

c. Prevent the chute from becoming tangled in rotor blades by having a ground crew collapse and secure it as soon as it can be reached.

1-93. Transportation Tiedown Kit (AVIM).

The transportation tiedown attachment kit (T99) is used to help secure the helicopter when it is being transported by ship. The kit consists of two types of tiedown fitting assemblies. Fitting assemblies 114G1049-15 are installed on the rotor shafts. Fitting assemblies 114G1049-3 are installed on the aft fuselage jack pad bases. When installed, the fittings provide attaching points for securing cables.

1-94. Installation (AVIM). (See fig. 1-36.) Install the tiedown fitting assemblies as follows:

a. On helicopters fitted with rotor shafts with a 4-inch ID; install fitting assembly 114G1049-15 as follows:

(1) Remove cover 114G1049-20 from adapter plug 114G1049-18.

(2) Store the cover by securing it to the fitting assembly. Remove the bolt and washer from top of the fitting assembly, place the cover over plate 114G1049-21 and install the washer and bolt.

(3) Screw the fitting assembly into the rotor shaft.

b. On helicopters fitted with rotor shafts with $4\frac{7}{16}$-inch ID, install assembly 114G1049-15 as follows:

(1) Remove bolt, washer, and plate 114G1049-21 from the top of the fitting assembly.

(2) Remove covers 114G1049-19 and 114G1049-20 from adapter plug 114G1049-18.

(3) Remove the adapter plug from the fitting assembly.

(4) Store the two covers, the plate, and the adapter plug on top of the fitting body. Secure them with washer and bolt.

(5) Screw the fitting assembly into the rotor shaft.

c. Install fitting assemblies 114G1049-3 as follows:

(1) Remove the aft fuselage jack pad on each side of the helicopter. Use spanner or similar tool.

(2) Bolt adapter 114G1049-6 to the jack pad base.

(3) Insert ring 114G1049-8 into the groove of fitting 114G1049-7.

(4) Bolt the ring and fitting to the adapter.

1-95. Removal (AVIM). Remove tiedown fittings as follows:

a. Remove fitting assemblies 114G1049-15 by screwing fittings, with adapters, if installed, out of the rotor shafts.

b. Remove fitting assemblies 114G1049-3 from aft fuselage jack pad bases as follows:

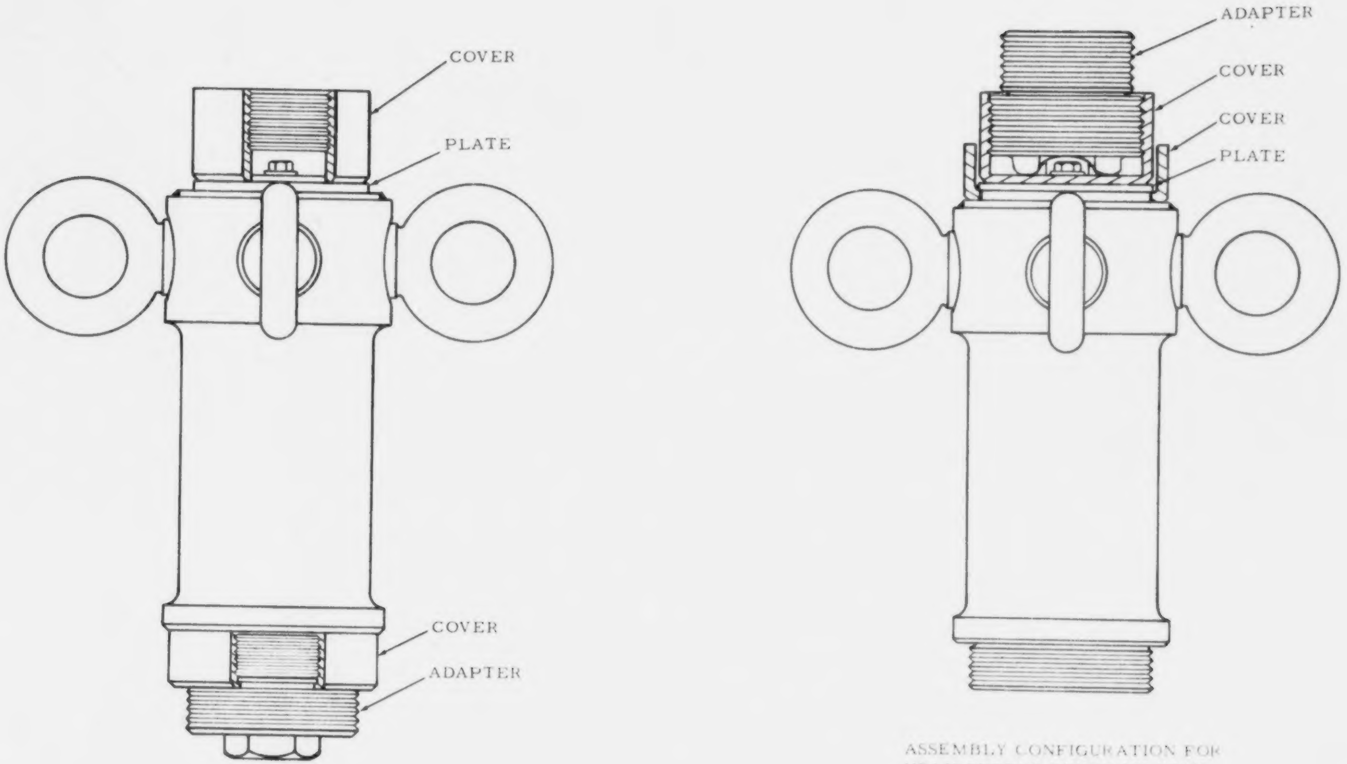
(1) Remove the four bolts that secure the fitting and ring to the adapter.

(2) Remove the bolt that secures the adapter to the jack pad base.

(3) Screw the jack pads into the jack pad bases. Use a spanner or similar tool.

1-96. Storage (AVIM). (See fig. 1-36.) If there is no further use for tiedown fitting assemblies, store them as follows:

a. Screw adapter plug 114G1049-18 into assembly body 114G1049-15. Install protective covers 114G1049-19 and 114G1049-20 over the adapter plug. Store plate 114G1049-21 on top of fitting body. Secure plate to body with washer and bolt.


COVER
PLATE
COVER
ADAPTER
ADAPTER
COVER
COVER
PLATE

ASSEMBLY CONFIGURATION FOR
HELICOPTERS EQUIPPED WITH
ROTOR SHAFTS WITH A
4-7/16-INCH ID.

ASSEMBLY CONFIGURATION FOR
HELICOPTERS EQUIPPED WITH
ROTOR SHAFTS WITH A
4-INCH ID.

B114-663-358

Figure 1-36. Rotor Shaft Tiedown Assembly Installation Configuration

b. Insert attaching bolt into adapter 114G1049-6 of the tiedown ring assembly. Insert ring 114G1049-8 into the groove of fitting 114G1049-7. Secure the fitting to the adapter with four bolts.

1-97. Application of Electric and Hydraulic Power.

Electric and hydraulic power can be applied to the helicopter in either of two ways: by operating the apu or by connecting an external power supply. Refer to para 1-98 or 1-99.

1-98. Application of Electric and Hydraulic Power Using the Apu. (See fig. 1-37.) Start apu as follows:

CAUTION

Before starting the apu, position the blades so that one aft blade is located behind and 30 degrees off the centerline of the helicopter. This position will prevent a blade from striking the tunnel cover as hydraulic power, when first applied, will move the controls and cause the blades to flap.

NOTE

A strong tail wind can cause an apu to shut down due to overtemperature.

a. Open the apu manual fuel shutoff valve.

b. Set the UTILITY SYSTEM switch on the overhead panel in the cockpit to ON.

CAUTION

The hand pump can be damaged by careless operation. Do not slam the handle against the upper and lower stops. When two men operate the handle, do not overstress the pump by seeing how fast you can pump up pressure. Careless operation can result in broken mounting lugs, broken fulcrum support lugs, and cracked handle supports.

c. Check that the gage at the bottom of the 200-cubic-inch utility hydraulic system accumulator reads 3,000 psi. If it doesn't, charge it with the hand pump to 3,000 psi. The accumulator is on the right side of the cabin at sta 537. The hand pump is just forward of the accumulator.

d. Plug in the battery. Set cockpit switches and circuit breakers. Make sure pitot-static heat is off. Set the apu switch to STOP.

e. Set SAS and HYD BST switches to BOTH ON.

f. Set EMER SAS REL to RELEASE and battery switch to ON.

g. Check warning and caution lights. Check operation of apu press-to-test warning lights.

h. Set apu switch to APU. APU OVSP, HIGH EXH TEMP lights shall be on and LOW OIL PRESS shall be off.

i. Set GND APU-AGB switch to START and hold during apu start until NO. 2 HYD BOOST OFF caution light goes out.

CAUTION

If the battery does not have enough charge to start the apu, replace the battery. If the apu is started by an alternate method, do not reinstall the original battery. The helicopter electrical system does not enable controlled charging, and damage to the battery and helicopter can result because of thermal runaway.

j. Set the APU switch to START. Hold until apu tachometer shows 90 percent. Check the apu warning lights. All three lights shall be out. If a light is on, shut down the apu. Locate the fault in the system.

NOTE

If start cycle is stopped, set the APU switch to STOP before trying another start.

k. Set generator switches ON. Generator and rectifier caution lights shall go out.

NOTE

Should NO. 2 RECT OFF caution light stay on, momentarily operate searchlight or windshield anti-ice system. This will load DC secondary bus and light should go out.

CAUTION

If there is no hydraulic pressure in 30 seconds, shut down apu.

l. Check for normal flight control and utility hydraulic pressure.

m. Check for normal AFT TRANSMISSION oil temperature and pressure.

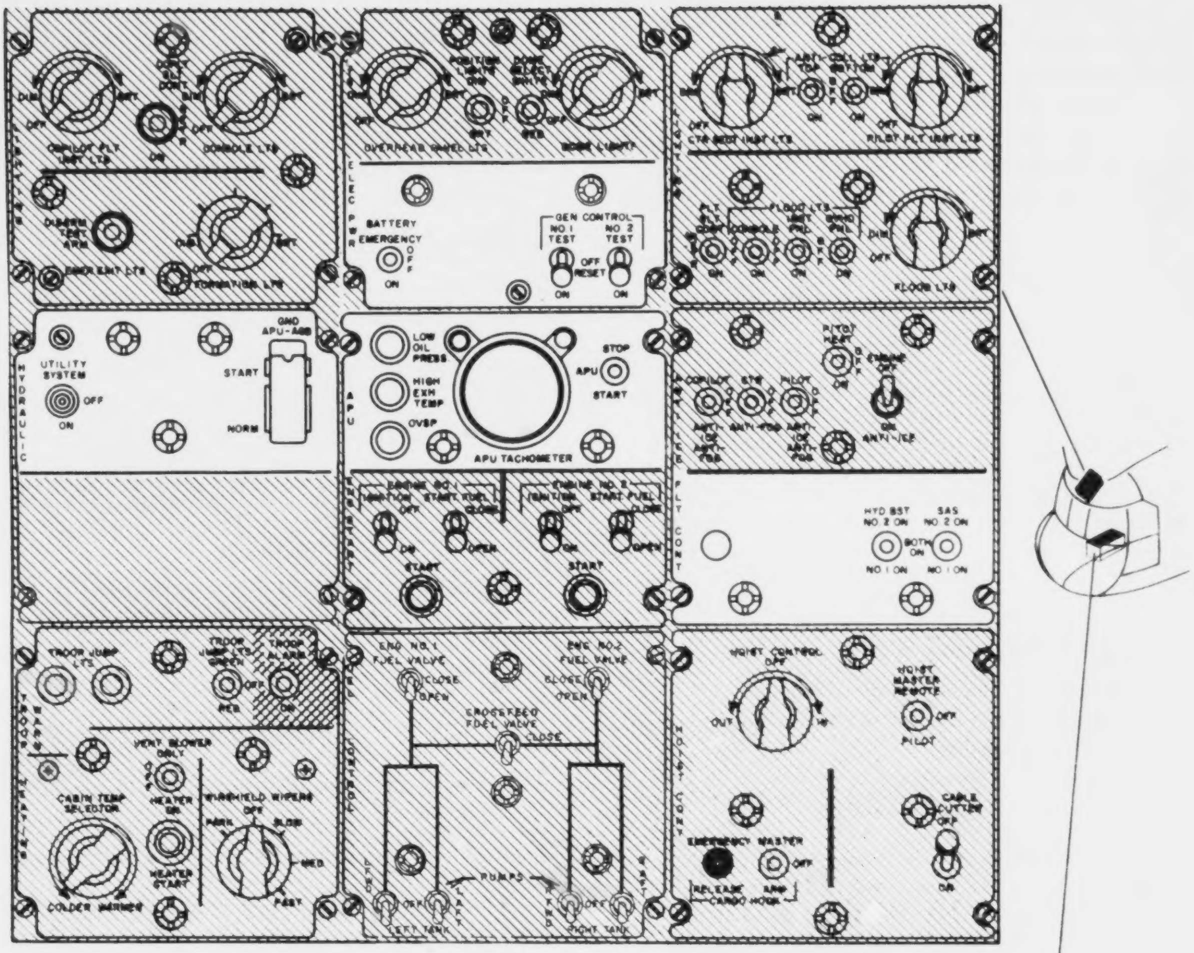
n. To shut down apu, set generator switches to OFF, set the APU switch to STOP.

o. Close the apu manual fuel shutoff valve.

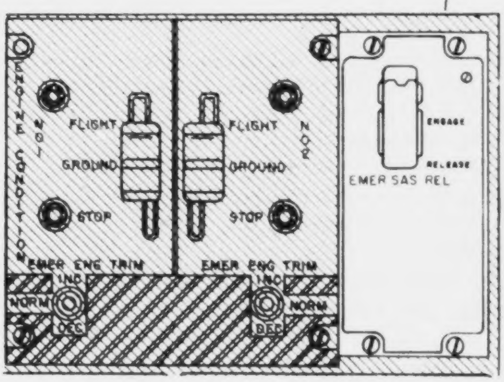
p. Set the battery switch to OFF.

q. Unplug the battery.

1-99. Application of Electric and Hydraulic Power, Using External Sources. (See fig. 1-38.) External power supply sources consist of an electric power unit to supply power to the helicopter electrical systems and a hydraulic teststand to supply hydraulic power to the helicopter hydraulic systems. Two receptacles are provided for connecting external electrical power to the helicopter. One is for connecting 28-volt dc power. The other is for connecting 115/200 volt, 3-phase (grounded-neutral) 400-Hz ac power. The receptacles are located at the forward end of the left pod at sta 175. Three pairs of hydraulic connections are provided for connecting external hydraulic power to the helicopter hydraulic systems. The aft pair of connections is for the No. 1 flight control hydraulic system. The center pair is for the No. 2 flight control hydraulic system. The forward pair is for the utility hydraulic system. The hydraulic connections are located between sta 534 and 594 on the right side of the helicopter.


DIM
BRT
OFF
COPILOT FLT INST LTS
CONSOLE LTS
ON
OVERHEAD PANEL LTS
DOME LIGHT
POSITION LIGHTS
BRT
RED
OFF
E L E C P W R
BATTERY
EMERGENCY
O F F
ON
GEN CONTROL
NO 1 TEST
NO 2 TEST
OFF RESET
ON
EMER EXIT LTS
FORMATION LTS
ANTI-COLL LTS
TOP BOTTOM
CTR INST INST LTS
PILOT FLT INST LTS
FLOOD LTS
CONSOLE
FLOOD LTS
H Y D R A U L I C
UTILITY SYSTEM
OFF
ON
GND APU-AGB
START
NORM
A P U
LOW OIL PRESS
HIGH EXH TEMP
OVSP
STOP
APU
START
APU TACHOMETER
ENGINE NO 1
ENGINE NO 2
IGNITION
START FUEL
OFF
CLOSE
ON
OPEN
START
PITOT HEAT
COPILOT
PILOT
ANTI-ICE
ANTI-FOG
ON
ANTI-ICE
F L T C O N T
HYD BST NO 2 ON
SAS NO 2 ON
BOTH ON
NO 1 ON
NO 1 ON
TROOP JUMP LTS
TROOP ALARM
OFF
ON
RED
VENT BLOWER ONLY
O F F
HEATER ON
HEATER START
CABIN TEMP SELECTOR
COLDER WARMER
WINDSHIELD WIPERS
PARK
OFF
SLOW
MED
FAST
ENG NO 1 FUEL VALVE
ENG NO 2 FUEL VALVE
CLOSE
OPEN
CROSSFEED FUEL VALVE
CLOSE
PUMPS
F W D
OFF
A F T
LEFT TANK
RIGHT TANK
HOIST CONTROL
OFF
OUT
IN
HOIST MASTER REMOTE
OFF
PILOT
CABLE CUTTER
OFF
ON
EMERGENCY
MASTER
OFF
RELEASE
ARM
CARGO HOOK

OVERHEAD PANEL (CH-47B)

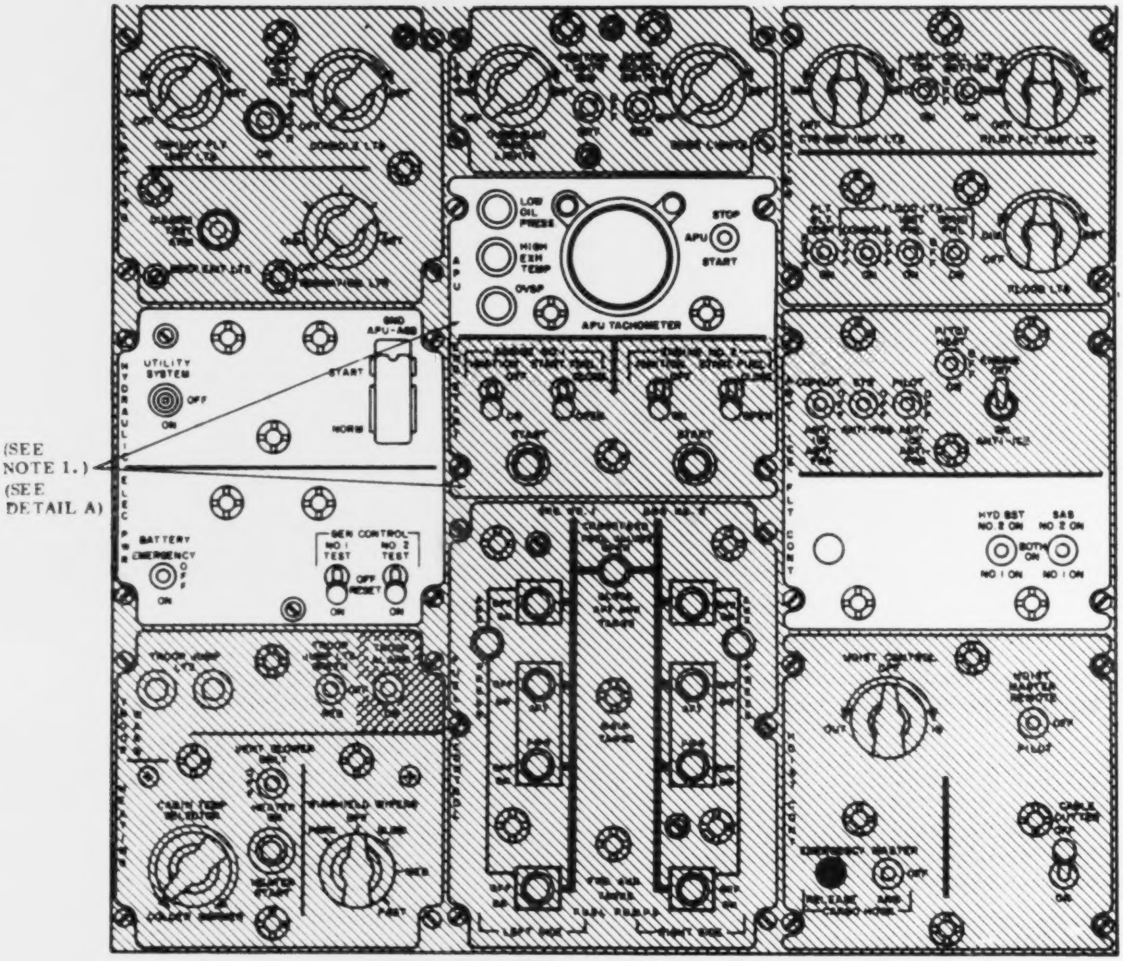

E N G I N E C O N D I T I O N
N O 1
N O 2
FLIGHT
GROUND
STOP
EMER ENG TRIM
INC
NORM
DEC
ENGAGE
RELEASE
EMER SAS REL

CENTER CONSOLE PANEL

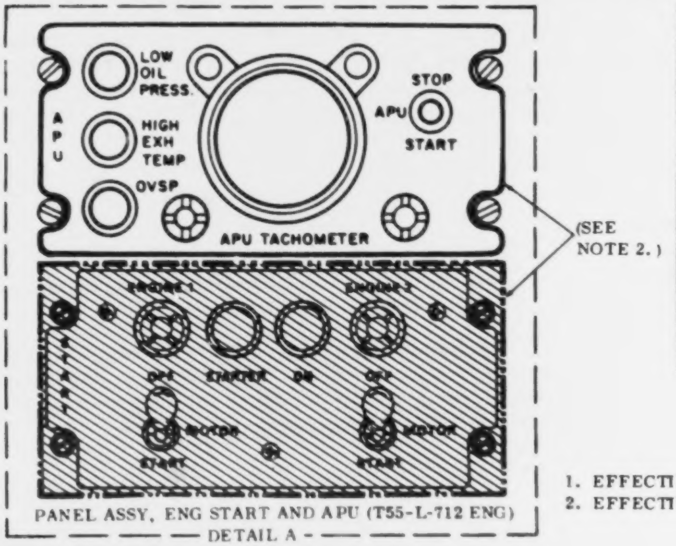
42 X 54

8114-942-20R①

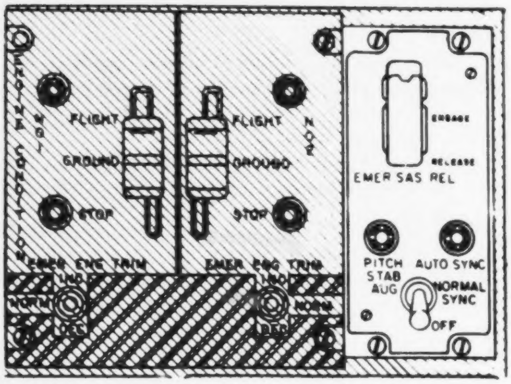
Figure 1-37. Center and Overhead Panels (Sheet 1 of 2)


(SEE NOTE 1.)
(SEE DETAIL A)
UTILITY SYSTEM
OFF
ON
START
NORM
BATTERY
EMERGENCY
OFF
ON
GEN CONTROL
NO 1 TEST
NO 2 TEST
OFF RESET
LOW OIL PRESS
HIGH EXH TEMP
OVSP
APU
STOP
START
APU TACHOMETER
HYD BST NO.2 ON
SAS NO 2 ON
BOTH ON
NO 1 ON

OVERHEAD PANEL (CH-47C)


LOW OIL PRESS.
HIGH EXH TEMP
OVSP
APU
STOP
APU
START
APU TACHOMETER
(SEE NOTE 2.)
ENGINE 1
ENGINE 2
STARTER
OFF
OFF
MOTOR
MOTOR
START
START

PANEL ASSY, ENG START AND APU (T55-L-712 ENG)
DETAIL A


ENGINE CONDITION
NO 1
NO 2
FLIGHT
FLIGHT
GROUND
GROUND
STOP
STOP
EMER ENG TRIM
EMER ENG TRIM
INC
NORM
DEC
ENGAGE
RELEASE
EMER SAS REL
PITCH STAB AUG
AUTO SYNC
NORMAL SYNC
OFF

CENTER CONSOLE PANEL

NOTES

1. EFFECTIVE ON HELICOPTERS WITHOUT MWO55 1520-227-30-34
2. EFFECTIVE ON HELICOPTERS WITH MWO55-1520-227-30-34

B114-942-20R②

Figure 1-37. Center and Overhead Panels (Sheet 2 of 2)

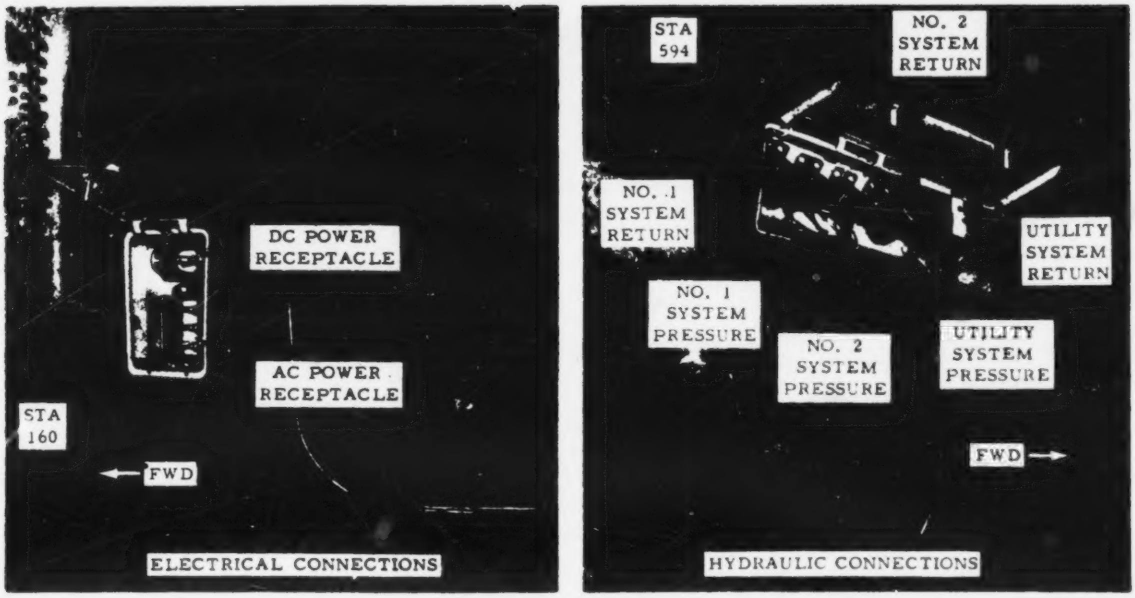

DC POWER RECEPTACLE
AC POWER RECEPTACLE
STA 160
FWD
ELECTRICAL CONNECTIONS
STA 594
NO. 2 SYSTEM RETURN
NO. 1 SYSTEM RETURN
UTILITY SYSTEM RETURN
NO. 1 SYSTEM PRESSURE
NO. 2 SYSTEM PRESSURE
UTILITY SYSTEM PRESSURE
FWD
HYDRAULIC CONNECTIONS
42x24
B114-746-20C

Figure 1-38. External Power Connections

a. Apply external electrical power using Aviation Ground Power Unit (AGPU) or equivalent as follows:

CAUTION

Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

(1) Set the EMER SAS REL switch to RELEASE. The switch is located on the center console. (See fig. 1-37.) This step need not be performed if work is to be done on the SAS.

(2) Connect a 28-volt dc power supply to the 28-volt dc receptacle at the forward end of the left pod.

NOTE

If ac power is connected to helicopter, it is not necessary to connect dc power.

(3) Connect a 115/200 volt, 3-phase, grounded-neutral, 400-Hz ac power supply unit to the 115/208V 400 CYCLE A.C. receptacle at forward end of the left pod.

CAUTION

Set the battery switch to OFF whenever electrical external power is disconnected or not operating. This will prevent battery drain.

(4) When disconnecting electrical power, make sure the electrical power supply unit is shut down. Disconnect it by pulling the plug from the receptacle on the helicopter.

CAUTION

When using external hydraulic power, a 3-micron absolute filter shall be used in the teststand.

CAUTION

Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

b. Application of external hydraulic power. Connect a Aviation Ground Power Unit (AGPU) or equivalent (10 gpm flow rate capacity and pressures up to 5,000 psi) to the applicable pair of test connections as follows:

CAUTION

Do not select the manual control valve FILLING position when the apu, teststand, or engines are running. Damage to equipment can result.

(1) Before connecting the hydraulic teststand to the utility hydraulic system test connections, turn the manual control valve handle to FILLING then return it to NORMAL. This relieves utility system pressure.

WARNING

If the WATER DRAIN button is not pressed, (step (2) below), personnel injury could occur when the tank cap is removed.

(2) (See fig. 7-32 and 7-58.) Before connecting hydraulic teststand to a flight control hydraulic system on 69-17125 and subq, and helicopters with MWO 55-1500-210-30/30, press the WATER DRAIN button on the air pressure regulator valve. This relieves pressure on the flight control hydraulic system. The valve is in the right side of the aft pylon. Open the right work platform for access.

(3) Connect hoses from the teststand to the corresponding test connections. Secure the connection by turning the coupling nuts a quarter turn. If the coupling nut is not connected properly, the red hex nut on the hydraulic system test panel will be visible.

NOTE

The teststand system pressure hose may be equipped with coupling nut 3205-8 or 3305-8 and the system return hose with coupling nut 3205-12 or 3305-12 (Aero-quip Corp) or equivalent. The 3205 series are for flare type fittings and 3305 are for flareless type fittings.

(4) If both No. 1 and No. 2 flight control hydraulic systems must be pressurized at the same time, use two teststands. If suitable tee connections are available, both systems can be pressurized using one teststand.

NOTE

Some hydraulic system tests require use of two teststands rather than a single teststand with tee connections. (Refer to para 7-5.)

(5) When disconnecting hydraulic power, make certain the hydraulic teststand is shut down. Disconnect it from the hydraulic system test panel by pulling coupling nuts straight from mating connections.

1-100. Battery Usage. When electrical power is not being used, unplug the battery.

1-101. Maintenance Data.

a. Standard torque limits. Tables 1-9 and 1-10, and FO-1 provide standard torque limits for threaded fasteners, hose and tube coupling nuts, and pipe thread fittings. FO-1 also includes minimum breakaway torque values for determining reusability of self-locking nuts. These standard torque values apply only when special torque values are not specified in procedures. General instructions for installation and fit of threaded fasteners are as follows:

(1) Thread shall not be in bearing when thickness of sheet or fitting is 1/32 inch, a maximum of two threads in bearing is permissible.

(2) In shear applications, thread shall not be in bearing regardless of material thickness.

(3) Washers are used to:

(a) Compensate for differences in bolt grip length and material thickness due to manufacturing tolerances, protective coating, and other surface variances.

(b) Distribute bearing load over a greater area to prevent damage to material under a bolt head or nut.

(c) Protect the material surface when a bolt or nut is tightened.

(d) Prevent galling of aluminum or other soft material when bolt or nut is tightened.

(e) Insulate dissimilar metals to prevent corrosion. The washer material should be similar to the material on which it rests rather than the bolt or nut material. This insures that if corrosion occurs, it will be between the bolt and washer, which can be replaced.

(4) When nut-bolt assemblies are installed, the nut shall not engage the first incomplete thread next to the bolt shank.

(5) Nuts are properly installed when all threads are engaged and the bolt chamfer extends thru the nut. When flat-end bolts are used, the threaded end must extend at least 1/32 inch thru the nut.

(6) Threads shall be clean and dry before installation. If threads are lubricated, torque limits of FO-1 are reduced by 30 percent.

(7) The tightening sequence in multiple fitting installation is as follows:

(a) Finger tighten all bolts or nuts.

(b) Snug up opposite bolts or nuts all around.

(c) Tighten opposite bolts or nuts all around to proper torque (FO-1). Do not torque adjacent bolts or nuts in sequence.

b. Self-retaining bolts.

WARNING

Standard bolts must not be substituted for self retaining bolts at any connection where self retaining bolts are installed. Loss of a bolt from any one of these flight control connections could result in the loss of the helicopter.

Table 1-9. Standard Torque Limits in Pound-Inches for Hose and Tube Coupling Nuts

TUBE OD	HOSE SIZE	NUT HEX	A	B	C	D	E
¼	-4	9/16	100-115	125-145	50-65	135-150	100-120
⅜	-6	11/16	170-200	225-265	100-125	270-300	210-250
½	-8	⅞	285-340	450-525	210-250	450-500	340-420
⅝	-10	1	370-440	540-630	300-350	650-700	400-480
¾	-12	1¼	415-490	675-790	425-500	900-1000	725-850
1	-16	1½	500-700		600-700	1200-1400	900-1150
1¼	-20	2	600-900		680-800	1200-1400	950-1150

CAUTION

Overtightening of hose and tube coupling nuts will cause thread and seal damage resulting in fitting leakage. Torque values are for threads lubricated with hydraulic fluid (C175), antiseize compound (C62), petrolatum (C244), or aircraft and instrument grease (C162), as applicable.

KEY

A — Steel or aluminum MS flareless fitting nuts: used on aluminum tube[1]
B — Steel or aluminum MS flareless fitting nuts: used on steel tube[1]
C — Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on aluminum tube[1]
D — Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596; used on steel tube[1]
E — Steel or aluminum flared fitting hose coupling nuts[1]

---

[1] Where use of a torque wrench would be difficult, use a conventional wrench to tighten coupling nuts. Tighten until a distinct increase in the torque required is noted. Continue tightening an additional [illegible] of a turn. Back off the nut. Again tighten until a distinct increase in the torque required is noted. Continue tightening an additional [illegible] to [illegible] of a turn.

Table 1-10. Standard Torque Limits in Pound-Inches for Pipe Thread Fittings

THREAD SIZE	WORKING TORQUE[1]	MAXIMUM TORQUE[1]
1/8-27	100	175
1/4-18	150	300
3/8-18	225	450

CAUTION

Be careful when tightening pipe fittings. Overtightening causes distortion, cracking, and leaks.

---

[1] Antiseize compound (C61) or (C62) shall be used on threads to prevent seizing and to aid in sealing. The compound shall be applied to the male fitting so that it does not contaminate the fluid in the system. Male and female fittings should be of different materials.

(1) Two types of self-retaining bolts are used. They are positive retention bolts and impedance bolts. Both types have a fail-safe feature which prevents loss of the bolt, if the nut comes off. A nut, safetied with a cotter pin, must be installed on each self-retaining bolt.

(2) Positive retention bolts have a pawl at the threaded end of the bolt shank. The pawl is spring loaded to an extended position. When extended, the pawl prevents the nut from being removed. Finger pressure compresses the pawl for removal of the nut and for removal of the bolt from the parts. Some of the bolts contain a heat shrunk bushing which replaces the sliding bushing in the fastener build-up. This prevents installation of the bolt without the bushing being installed. Placards are installed at each location for positive retention bolts.

c. Impedance bolts have either spring-loaded balls, or a spring ring on the bolt shank above the threads. These retaining elements extend beyond the diameter of the bolt and prevent it from sliding from the parts.

(1) Removal of Positive Retention Bolts. (See fig. 1-39.)

(a) Remove the cotter pin.

(b) Back the nut off until it is next to the pawl. Depress the pawl and back the nut off the bolt. Depress pawl and remove washer.

(c) Pull the bolt out until the pawl is next to the lug. Depress the pawl and pull the bolt out until the pawl is inside the lug.

(d) Hold the fastener stack-up together and pull the bolt out.

NOTE

If the stack-up separates while removing the bolt, the pawl may extend and catch on the edge of the fastener, bearing, or bushing. If the pawl extends while removing the bolt, use a thin piece of metal such as a knife edge or rule to depress the pawl. Do not hammer the bolt out.

(e) On bolts with integral heat-shrunk bushings, examine the bushing for galling. If there is galling, rework the bolt to reduce bushing diameter. (Refer to step (2).)

(2) Rework of Positive Retention Bolts. If the bushing of a removed bolt is galled, rework it as follows:

(a) Measure the diameter of the bushing. If it is greater than the diameter after rework shown in Table 1-10.1, reduce the diameter by machine turning or grinding. Maintain a surface finish of 63 microinches or less.

(b) If galling extends below the reduced diameter, discard the bolt.

(c) Inspect the reworked bolt assembly. Use magnetic particle inspection per MIL-I-6868. Use circular magnetization thru the ends of the assembly at 800 to 1000 amperes. Use longitudinal inspection, charged coil, at 800 to 1200 amperes.

(3) Installation of Positive Retention Bolts. (See fig. 1-39.)

(a) Place the countersunk washer under the bolt head. Make sure the countersink is next to the bolt head. The positive retention bolt-bushing assembly does not have a washer under the head.

CAUTION

Do not apply antiseize compound on the thread of the bolt or nut.

(b) Ap a coat of antiseize compound (C61) to the od of the bushing on bolts 114R3650 series.

(c) Align the bearing, lugs, bolt, and bushing. Install the bolt.

(d) Place washer(s) on the bolt. Use thick or thin washers as necessary for cotter pin installation.

(e) Install the nut. Torque it to the minimum torque. If cotter pin holes are not aligned, tighten the nut to align holes. Do not exceed the maximum torque in the table.

(f) Install the cotter pin.

(g) Make sure the pawl on the bolt is extended. Make sure placards are installed near the fastener installation.

(4) Removal of Impedance Bolts. (See fig. 1-40.)

(a) Remove the cotter pin and nut.

(b) Push the bolt shank in the removal direction until the retaining element is compressed.

(c) Grasp the bolthead and pull the bolt out of the parts.

(5) Installation of Impedance Bolts. (See fig. 1-40.)

NOTE

No lubricant should be applied to the bolt shank or thread.

(a) When a washer is required under the bolthead, place the washer on the bolt shank.

(b) Push the bolt thru the parts until the retaining element protrudes beyond the connected parts.

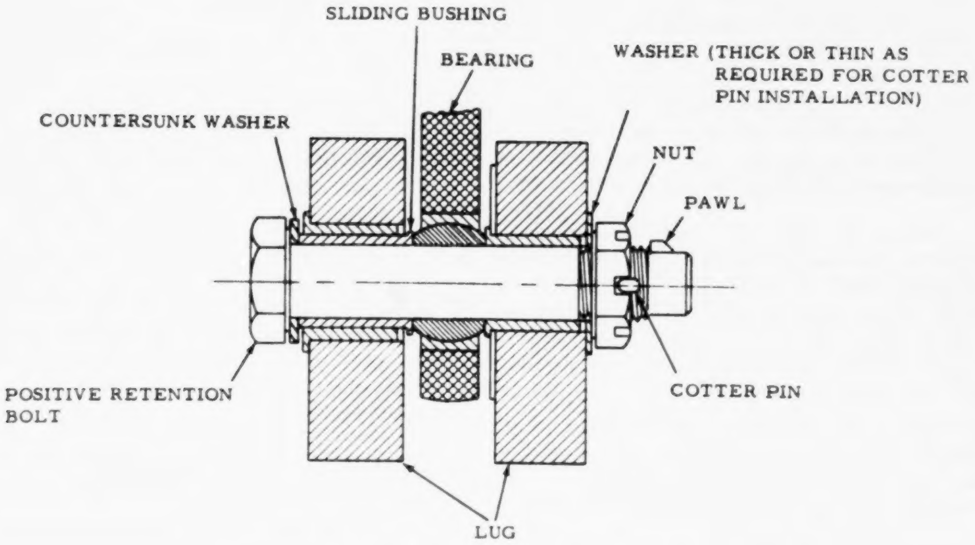
CAUTION

Do not use any nuts except the special counterbored nuts with impedance bolts. Standard nuts, without the retained washer and counterbore, bottom out on the bolt thread. This damages the retaining element before the proper torque value is reached. An exception, where a standard nut is used on an impedance bolt is the attachment of the connecting links to the control valve of the pivoting and swiveling actuators. This exception is on CH-47C helicopters. The bolt retaining element at this connection is protected by a special set of counterbored bushings.

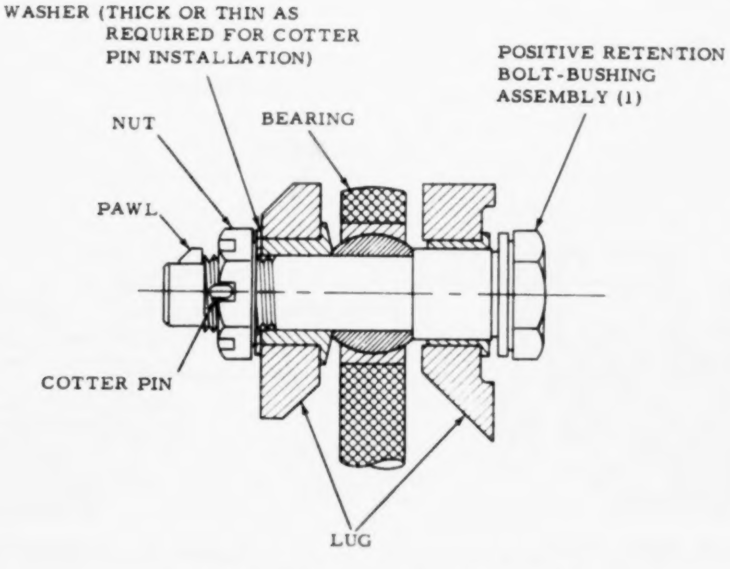
Table 1-10.1 Positive Retention Bolt Assembly Rework Diameters

Bolt Assembly Part No.	Bushing Diameter Before Rework	Bushing Diameter After Rework
114R3650-3	0.8744 to 0.8749	0.8708 to 0.8713
114R3650-4	0.8744 to 0.8749	0.8708 to 0.8713
114R3650-6	0.6244 to 0.6249	0.6218 to 0.6223
114R3650-7	0.7806 to 0.7811	0.7774 to 0.7779
114R3650-9	0.9382 to 0.9387	0.9343 to 0.9348
114R3650-11	0.7507 to 0.7512	0.7476 to 0.7481
114R3650-13	0.6244 to 0.6249	0.6218 to 0.6223
114R3650-15	0.6244 to 0.6249	0.6218 to 0.6223

All Dimensions In Inches


SLIDING BUSHING
BEARING
WASHER (THICK OR THIN AS REQUIRED FOR COTTER PIN INSTALLATION)
COUNTERSUNK WASHER
NUT
PAWL
POSITIVE RETENTION BOLT
COTTER PIN
LUG

TYPICAL INSTALLATION FOR POSITIVE RETENTION BOLT (2)


WASHER (THICK OR THIN AS REQUIRED FOR COTTER PIN INSTALLATION)
POSITIVE RETENTION BOLT-BUSHING ASSEMBLY (1)
NUT
BEARING
PAWL
COTTER PIN
LUG

TYPICAL INSTALLATION FOR POSITIVE RETENTION BOLT-BUSHING ASSEMBLY (1)

42 x 48

B114-919-34K1

Figure 1-39. Positive Retention Bolt Installation

Table 1-11. (Deleted)

(c) Place washer(s) on the bolt.

(d) Install the nut as follows:

CAUTION

If a thin washer is used under the nut, do not let the inner diameter of the washer become caught on the bolt retaining element. False torque readings and damage to the hardware can result.

1. Torque the nut to the minimum required torque. Check that no axial looseness exists in the bolt-nut stackup. **CHECK THAT A MINIMUM OR MAXIMUM TORQUE OF 10 POUND-INCHES IS REQUIRED TO ROTATE THE BOLT-NUT STACKUP.** Low rotation torque or axial looseness is corrected by adding a washer under the nut and then repeating this step.

2. Install the cotter pin if nut castellations are aligned with pin hole. If castellations are not in line with the pin hole, tighten the nut up to the maximum allowable torque as required for alignment. Install the cotter pin.

NOTE

Abrupt increases in the torque required to tighten the nut is an indication of a bottomed thread or a jammed washer. Remove nut and examine hardware if this damage is suspected.

1-102. Maintenance Crane.

The maintenance crane assembly is used for removal and installation of engines, transmissions, and rotor components. The maintenance crane includes a base plate, cabin upright, azimuth control, mast and boom, and a jib boom assist.

1-103. Installation. (Refer to table 1-13 and see fig. 1-41.) To install maintenance crane assembly (T5) at the forward or aft position on helicopter, remove the crane from the maintenance crane storage and transportation cart and proceed as follows:

a. If the crane is to be installed in the forward position, remove the fuselage access cover plate and the ceiling panel cover plate at sta 154.86, bl 27.88 right side. If the crane is to be installed in the aft position, remove the fuselage access cover plate and the ceiling panel cover plate at sta 445.25, bl 26.5 right side. Drop the access cover plate thru the hole in fuselage.

WARNING

Make sure that correct quick-release pins NAS-1334A2C14 are installed. Shorter or improperly secured pins could work out of receptacles in the floor. This would allow the base plate to move and the load on the crane to fall.

b. Position base plate assembly (5), on the fuselage floor at sta 154.86, bl 27.88, or at sta 445.25, bl 26.5 with the reinforcing plate facing aft. Remove the two quick-release pins from their stowage. Secure the base plate to the floor with pins. Check for positive locking of the base plate by trying to lift it. You cannot lift the base plate if pins are in and locked.

WARNING

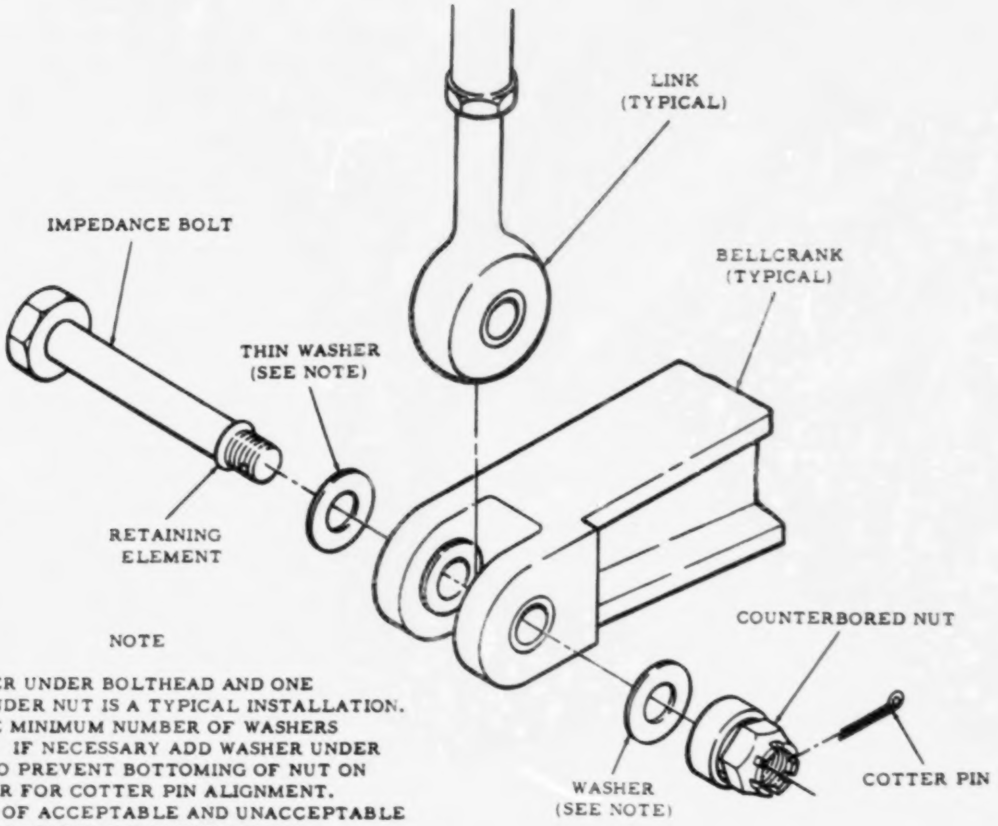
Do not attempt to align holes in cabin upright with fingers. Personal injury may occur.

c. From inside the helicopter, position cabin upright assembly (8) on the base plate at CH-47A AFT or CH-47A FWD position. Bolt the assembly to the base plate. Remove the quick-release pin from the cabin upright. Push the outer tube up thru the hole in the fuselage. Pin the tube in place at the CH-47A position.

d. From outside the helicopter, position the sleeve assembly over the cabin upright outer tube. Fit it into the hole in the fuselage.

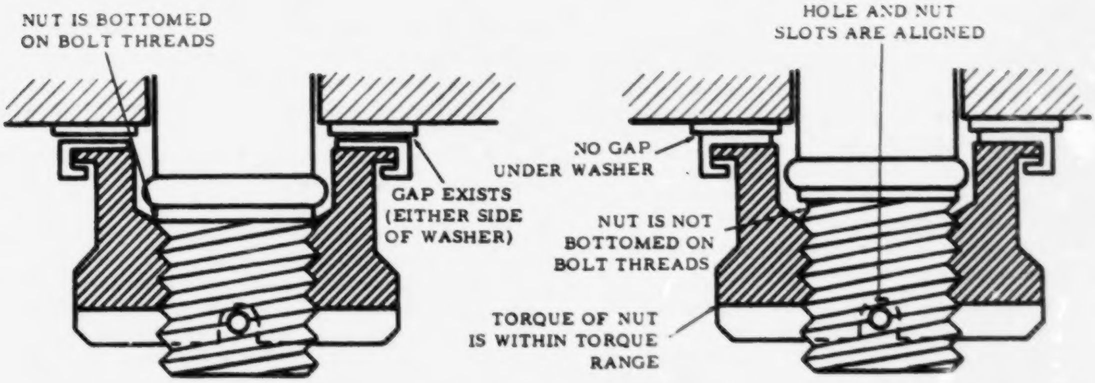
e. Lift azimuth control assembly (4) onto the top of the fuselage. Remove the screw from the top of the fuselage at the position marked STA 179.7, BL 27.4, or at the position marked STA 419.5, BL 27.4. Install the azimuth control over the cabin upright, and insert the quick-release pin. Remove the captive screw from its stowage. Secure azimuth control at fuselage screw hole, using captive screw. Handtighten the screw. Handtighten the screw. Stow the removed fuselage screw in captive screw storage.

Table 1-12. (Deleted)


LINK
(TYPICAL)
IMPEDANCE BOLT
BELLCRANK
(TYPICAL)
THIN WASHER
(SEE NOTE)
RETAINING
ELEMENT
COUNTERBORED NUT
WASHER
(SEE NOTE)
COTTER PIN

NOTE

ONE WASHER UNDER BOLTHEAD AND ONE WASHER UNDER NUT IS A TYPICAL INSTALLATION. THIS IS THE MINIMUM NUMBER OF WASHERS REQUIRED. IF NECESSARY ADD WASHER UNDER THE NUT TO PREVENT BOTTOMING OF NUT ON THREADS OR FOR COTTER PIN ALIGNMENT. EXAMPLES OF ACCEPTABLE AND UNACCEPTABLE NUT INSTALLATIONS ARE SHOWN BELOW.


NUT IS BOTTOMED
ON BOLT THREADS
GAP EXISTS
(EITHER SIDE
OF WASHER)
HOLE AND NUT
SLOTS ARE ALIGNED
NO GAP
UNDER WASHER
NUT IS NOT
BOTTOMED ON
BOLT THREADS
TORQUE OF NUT
IS WITHIN TORQUE
RANGE

NUT INSTALLATION IS UNACCEPTABLE:

1. IF A SUDDEN INCREASE OF TORQUE IS DETECTED WHEN TIGHTENING NUT.
2. IF AFTER NUT IS TORQUED, NUT AND BOLT STACKUP CAN BE TURNED WITH LESS THAN 10 POUND-INCHES OF TORQUE.

NUT INSTALLATION IS ACCEPTABLE:

1. IF NUT IS TIGHTENED WITHIN TORQUE RANGE, PIN HOLE AND NUT ARE ALIGNED.
2. TORQUE REQUIRED TO TURN NUT AND BOLT STACKUP IS 10 POUND-INCHES OR MORE.

42 x 54

B114-915-34K1

Figure 1-40. Impedance Bolt Installation

Table 1-13. Weight of Crane-Removable Components

COMPONENT	APPROXIMATE WEIGHT IN POUNDS
Engine Combining Transmission	325
Forward Transmission Unit (with hub and swashplate)	1,800
Rotary-Wing Blade (each) (metal)	315
Rotary-Wing Blade (each) (fiberglass)	353
Rotary-Wing Head (fwd or aft)	645
Swashplate Assembly	
Aluminum (fwd or aft)	136
Steel (aft only)	260
Aft Rotary-Wing Drive Shaft	395
Power Plant Assembly (Dry)	
T55-L-7B Powerplant	
(with transmission and transmission fairing)	808.2
(without transmission and transmission fairing)	692.1
T55-L-7C Powerplant	
(with transmission 114D6001 series and transmission fairing)	826.5
(with transmission 114D6200 series and transmission fairing)	848.3
(without transmission and transmission fairing)	711.4
T55-L-11ASA Powerplant	
(with transmission and transmission fairing)	961.0
(without transmission and transmission fairing)	864.0
T55-L-11D Powerplant	
(with transmission and transmission fairing)	1001
(without transmission and transmission fairing)	868
T55-L-712 Powerplant	
(with transmission and transmission fairing)	1037
(without transmission and transmission fairing)	896

f. Rotate the cabin upright by the azimuth control handle. Make sure that all parts move freely.

g. Lift jib boom assist assembly (1) onto the top of the fuselage. Position the jib boom on the cabin upright. Pin the fork end to the lower attaching hole in the upright. Position clevis-type fitting (3) over end of upright tube. Pin it to jib boom backstay (2).

h. Position mast and boom assembly (7) on the ground next to the helicopter. Make sure the trolley hook is towards the center of the helicopter for either forward or aft installation. Attach guide lines to the assembly. Make sure that winch handles and hook are stowed.

i. Position rotary-wing blades so that they will not be struck when the mast and boom assembly is lifted.

j. Attach the jib boom hook to the mast and boom assembly hoist attachment point. Lift the assembly, using guide lines to prevent it from swinging. When the mast and boom assembly has been raised above the fuselage, rotate the jib boom, by azimuth control, toward the center of the helicopter. Rotate the assembly so that the trolley hook faces the cabin upright. Then stand the assembly on the walkway.

k. Remove guide lines from the mast and boom assembly. Release the jib boom hook from the mast and boom assembly hoist attachment point. Remove the jib boom assist from the cabin upright.

CAUTION

Make sure that pivot bolt (13) is fully engaged into the slot at the top of cabin upright assembly (8). Otherwise, the mast and boom assembly will not be fully secure and could slip while it is being operated.

l. Rotate cabin upright (8) thru 180°. Lift mast and boom assembly (7) so that pivot bolt (13) fits into the slot in the cabin upright. The mast and boom assembly will support itself horizontally.

m. Remove the backstay stowage pin and unstow trolley and hook assembly (6). Remove quick-release pin (14) from the mast, unstow and install winch handles, and attach a guide line to the hook.

NOTE

When the hook is being winched out with no load, pull on the guide line attached to the hook to prevent the cable from tangling.

n. Raise the boom manually and take up cable slack with the trolley winch. Raise the mast manually. At the same time, continue to wind up the boom until attaching hole of backstay (10) aligns with the lower of three holes in the mast.

o. Insert attached quick-release pin (15) thru backstay and mast. Insert attached quick-release pin (14) thru the mast and cabin upright.

1-104. Removal. (See fig. 1-41.) Remove the maintenance crane from the forward or aft position as follows:

a. Take up cable slack with the trolley winch. Move trolley and hook assembly (6) to the end of boom (9). Remove quick-release pin from backstay (10). Remove quick-release pin from the mast and cabin upright. Lower mast (11) manually. At the same time, lower boom (9) by unwinding the trolley winch until the assembly is completely folded.

b. Stow the backstay by means of the backstay stowage pin. Install the quick-release pin in the mast. Stow the hook. Remove and stow winch handles. Attach guide lines to mast and boom assembly (7).

c. Lift the mast and boom assembly from the cabin upright onto the walkway.

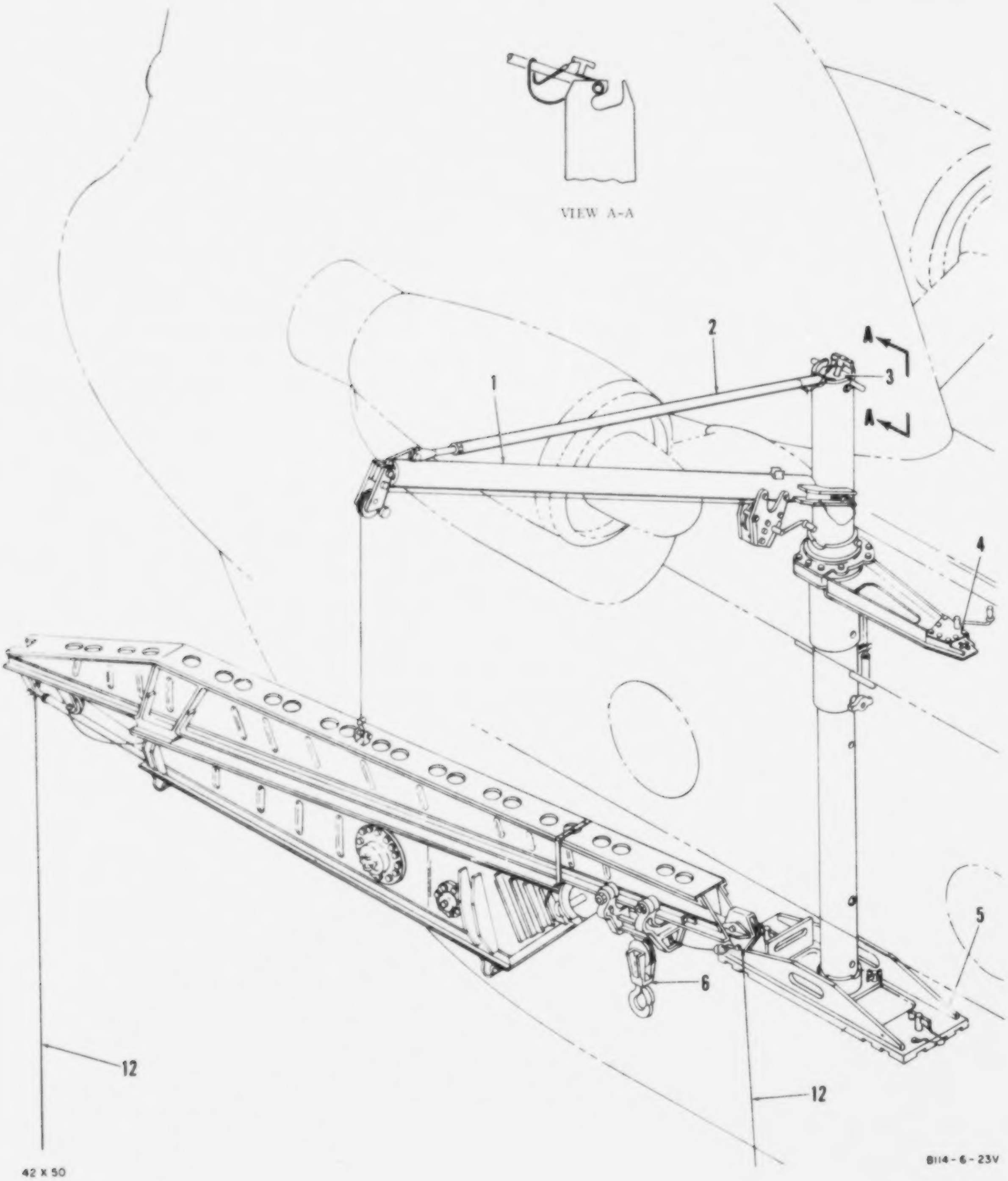
d. Rotate the cabin upright thru 180°. Position jib boom assist assembly (1) on the cabin upright. Pin the fork end of the assembly to lower attaching hole in upright. Position clevis type fitting (3) over end of upright tube and pin it to jib boom backstay (2).

e. Attach the jib boom to the mast and boom assembly hoist attachment point. Lift mast and boom assembly (7) and rotate the jib boom by azimuth control. Lower the assembly to the ground. Use guide lines to keep the assembly from swinging.

f. Remove the guide lines and jib boom hook from the mast and boom assembly. Remove the jib boom assist from the cabin upright.

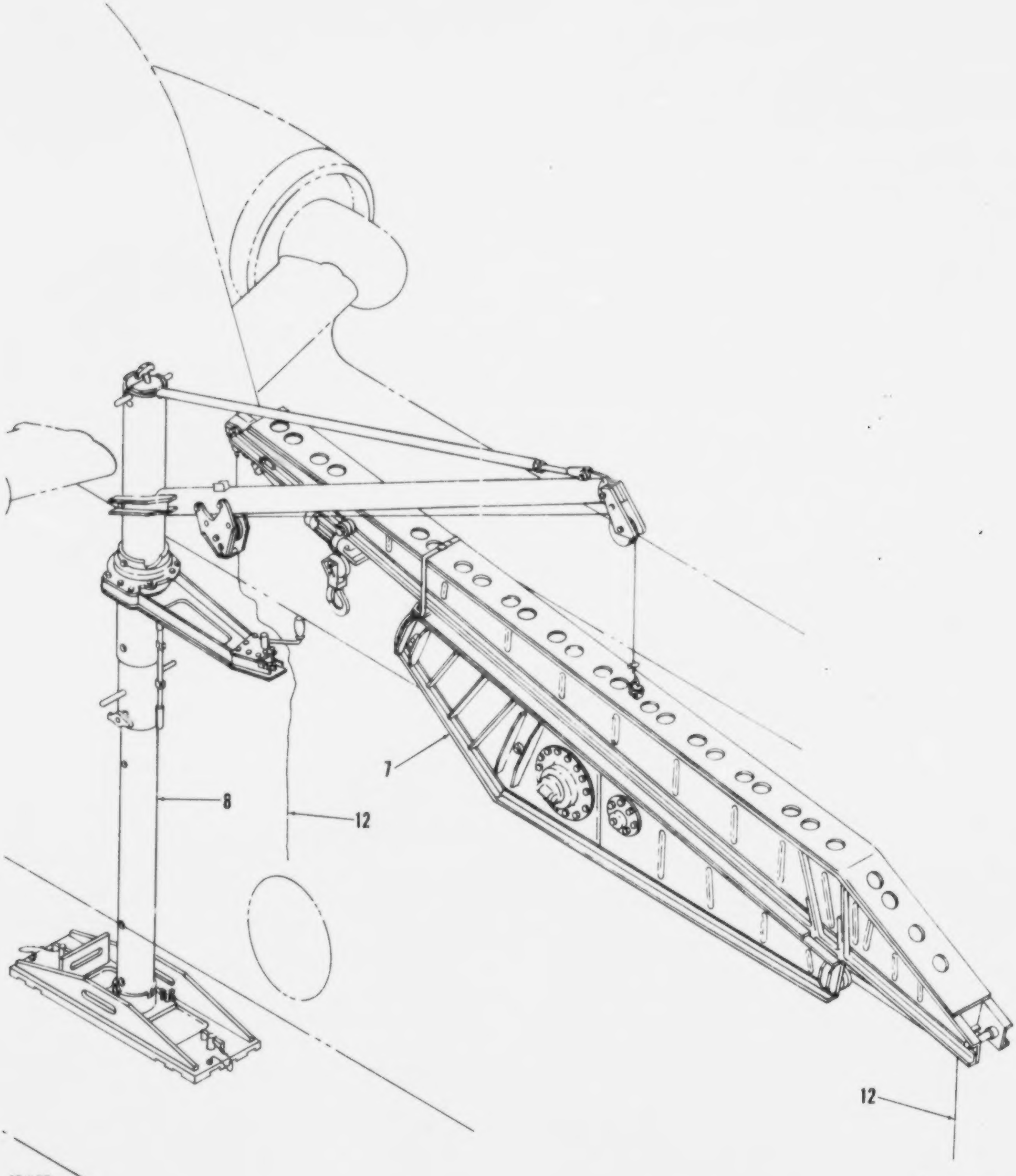
g. Remove the azimuth control captive screw and quick-release pin. Remove the azimuth control from the cabin upright. Reinstall the screw in the top of the fuselage. Reinstall the captive screw in stowage and reinstall the quick-release pin in the azimuth control.

h. Remove the sleeve assembly from the hole in the fuselage. This completes operations on top of the helicopter.



1. Jib boom assist assembly
2. Jib boom backstay
3. Clevis-type fitting
4. Azimuth control assembly
5. Base plate assembly
6. Trolley and hook assembly
7. Mast and boom assembly
8. Cabin upright assembly
9. Boom
10. Backstay
11. Mast
12. Guide lines
13. Pivot bolt
14. Quick-release pin
15. Quick-release pin

Figure 1-41. Maintenance Crane (Sheet 1 of 4)


7
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12
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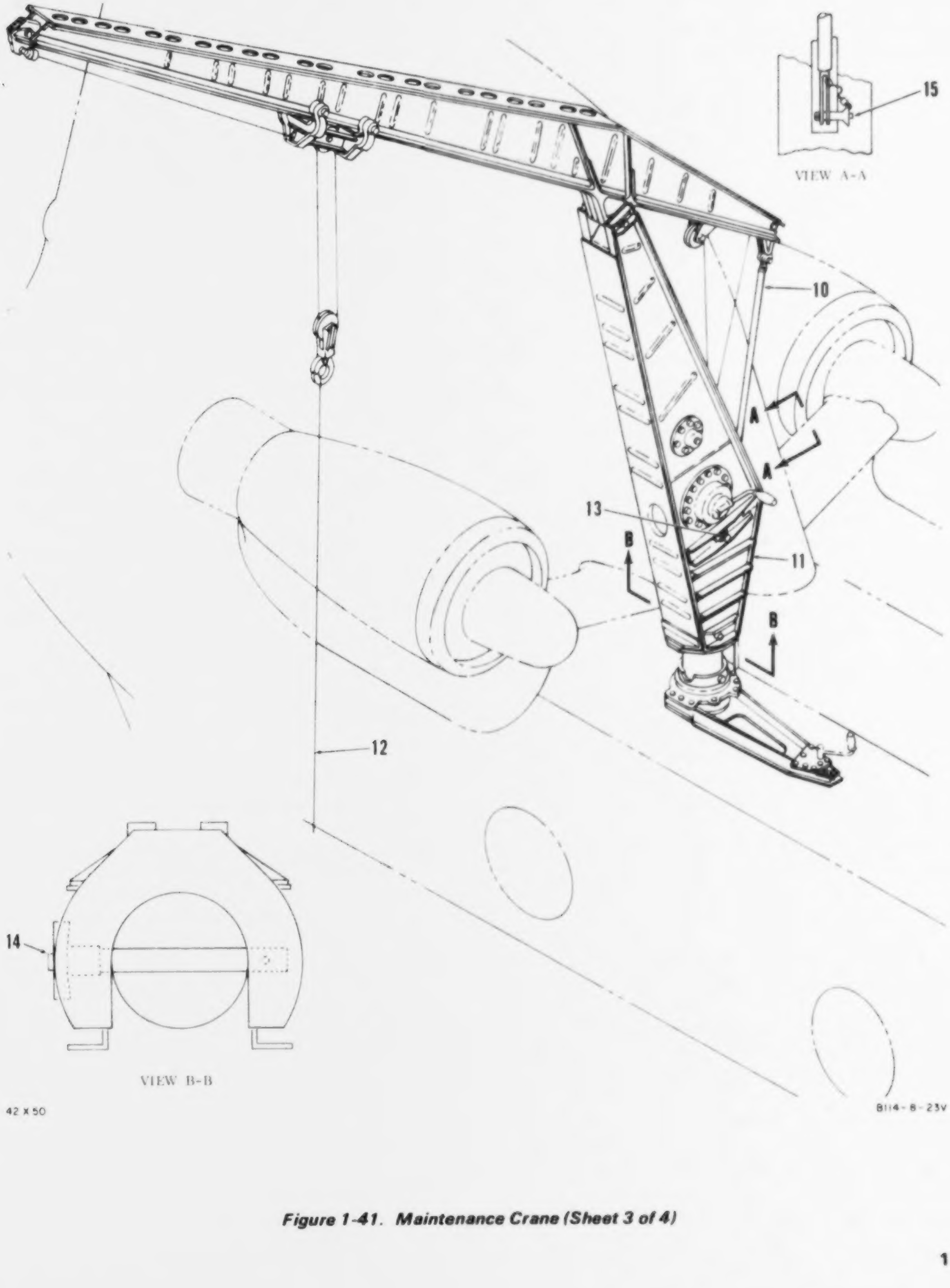
42 X 50
B114-7-23V

Figure 1-41. Maintenance Crane (Sheet 2 of 4)


15
VIEW A-A
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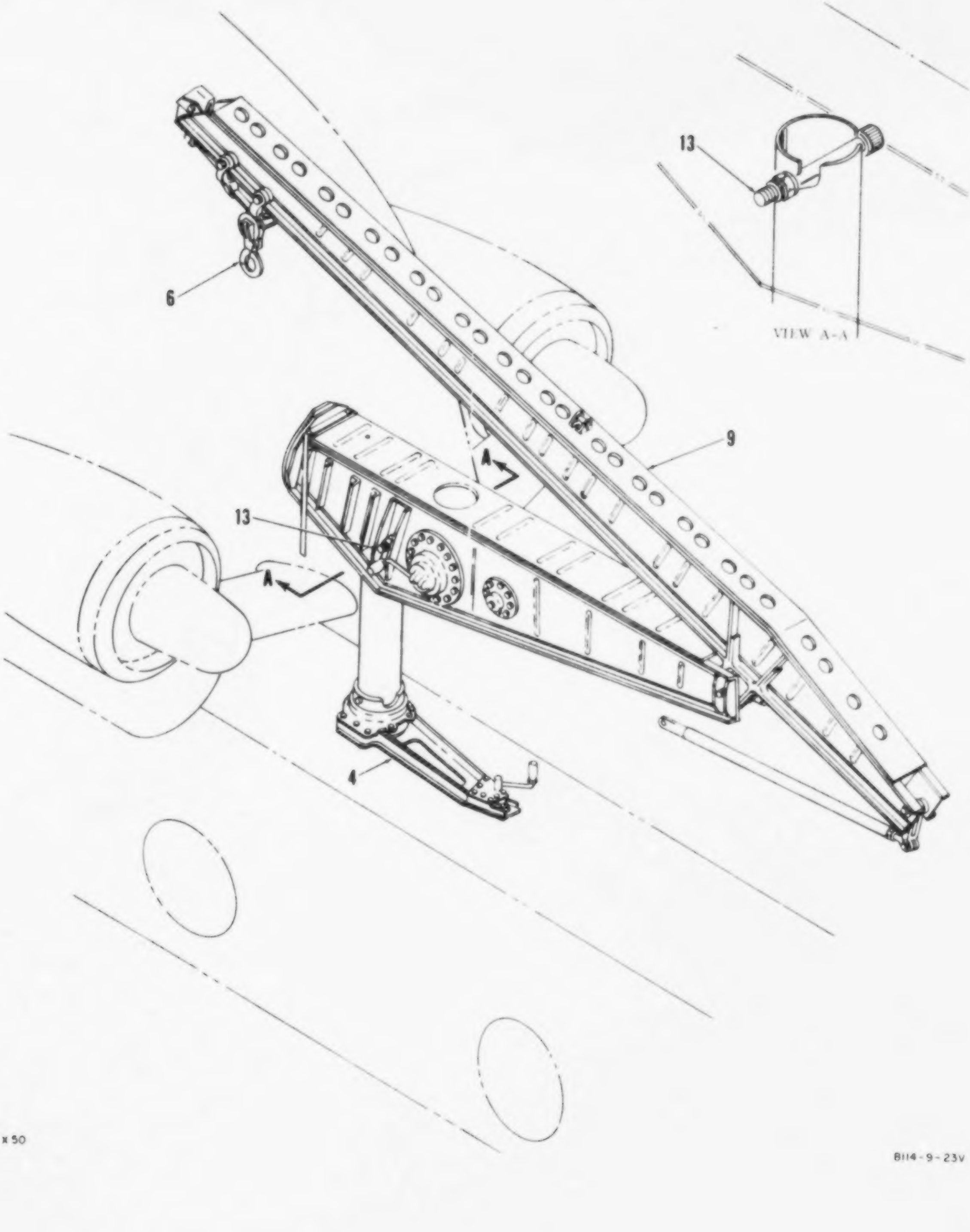
VIEW B-B
42 X 50
B114-8-23V

Figure 1-41. Maintenance Crane (Sheet 3 of 4)


13
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42 x 50
B114-9-23V

Figure 1-41. Maintenance Crane (Sheet 4 of 4)

i. Remove the bolts and quick-release pin from cabin upright assembly (8). Lower the outer tube slowly. Do not allow it to drop. Reinstall the pin in the cabin upright, and remove the assembly from the base plate.

j. Remove the quick-release pins from base plate assembly (5). Remove the base plate. Reinstall quick-release pins in their stowage on the base plate.

k. Reinstall the fuselage access cover plate and ceiling panel cover plate.

l. Store the maintenance crane and its subassemblies.

1-105. Replacement of the Azimuth Drive Worm Gear. (See fig. 1-42.)

a. Remove nine nuts (10), washers (2), and bolts (1) securing worm gear cap (3) to the azimuth drive housing. Remove the cap.

b. Remove nut (10), washer (2), and bolt (24), at each end of shaft connector (25). Remove the shaft connector from the housing.

c. Drive worm shaft (27) from the azimuth drive housing and remove worm (28) key (26) and bearings (29 and 30).

d. Remove bearing (4), spacer (5), and worm gear (6).

e. Apply a coat of grease (C163) to new worm (28) and worm gear (6). Install worm gear in housing.

f. Position worm (28) and bearings (29 and 30) in housing. Install key (26) in worm shaft. Install shaft (27) in housing while engaging worm (28) with it.

g. Bolt shaft connector (25) to worm shaft (27) and helical gear shaft (11) with two bolts, washers, and nuts.

h. Install spacer (5) and bearing (4) on worm gear (6). Install worm gear cap (3) and secure it with nine bolts, washers, and nuts.

1-106. Replacement of the Azimuth Drive Pinion Shaft. (See fig. 1-42.)

a. Remove captive screw (16) from its stowed position.

b. Remove the crank handle.

c. Remove six nuts (10), washers (2), and bolts (1) securing helical gear cap (19) to azimuth drive housing. Remove cap (19), pinion shaft (20), and helical gear (18) as a unit.

d. Remove helical gear (18) from pinion shaft (20). Remove key (21) and bearings (22 and 23) from pinion shaft (20). Then slide shaft out of cap (19).

e. Coat helical gear (18) with grease (C163).

f. Slide new pinion shaft (20) thru cap (19). Install bearings (22 and 23) and key (21) in shaft. Assemble helical gear (18) to pinion shaft.

g. Install helical gear cap (19) on azimuth drive housing and secure it with six bolts (1), washers (2), and nuts (10).

h. Install the crank handle on the pinion shaft.

i. Install captive screw (16).

1-107. Replacement of Jib Boom Assist Nylon Rope. (See fig. 1-43.)

a. Remove nut (3), washer (2), and bolt (13) from pulley support plate (1) and remove the pulley.

b. Remove screws (8) securing cover (7) to winch side plate.

c. Remove nut (5), washer (4), and bolt (10) securing drum and gear (9) to winch side plate.

d. Remove the drum. Detach nylon rope (12) and hook (11).

e. Attach a new rope to the drum by feeding it thru hole in drum side plate. Knot the end so rope cannot pass back thru the hole in the side plate.

f. Place the drum in the winch housing and secure it with bolt (10), washer (4), and nut (5).

g. Place the pulley between the pulley support plates. Align holes, and install bolts (13), washers (2), and nut (3).

h. Pass rope over pulley and install hook (11) at end of rope.

1-108. Replacement of Trolley Pulleys. (See fig. 1-44.)

a. Operate trolley winch and boom winch to slacken cables.

b. Remove quick-release pin (13) which secures boom hook cable to trolley (21). Lower cable and stow quick-release pin.

c. Remove cotter pin (12), nut (11), washers (8), and bolt (23) securing pulleys to trolley. Remove pulleys (15 and 20).

d. Remove guide pins (10 and 24) from trolley.

e. Reeve trolley cable (14) under and around replacement trolley pulley (15). Slide both new pulleys into trolley. Align holes, and install pulley securing bolt. Make sure washer (8) is under the bolt head.

f. Pass boom hook cable (19) over hook pulley (20). Install guide pins (10 and 24) in trolley. Install washer (8), nut (11), and cotter pin (12) on bolt (23).

g. Place boom hook cable eye in trolley. Align holes, and install quick-release pin (13).

1-109. Replacement of the Trolley Cam Followers. (See fig. 1-44.)

a. Operate trolley winch and boom winch to slacken cables.

b. Remove quick-release pin (13) securing boom hook cable to trolley (21). Lower the cable and stow the quick-release pin.

c. Loosen the barrel on cable lock (7) and remove trolley cable (14).

d. Remove pulley guide pins from hook (16). Feed hook cable (19) around hook pulley and separate the cable from the hook.

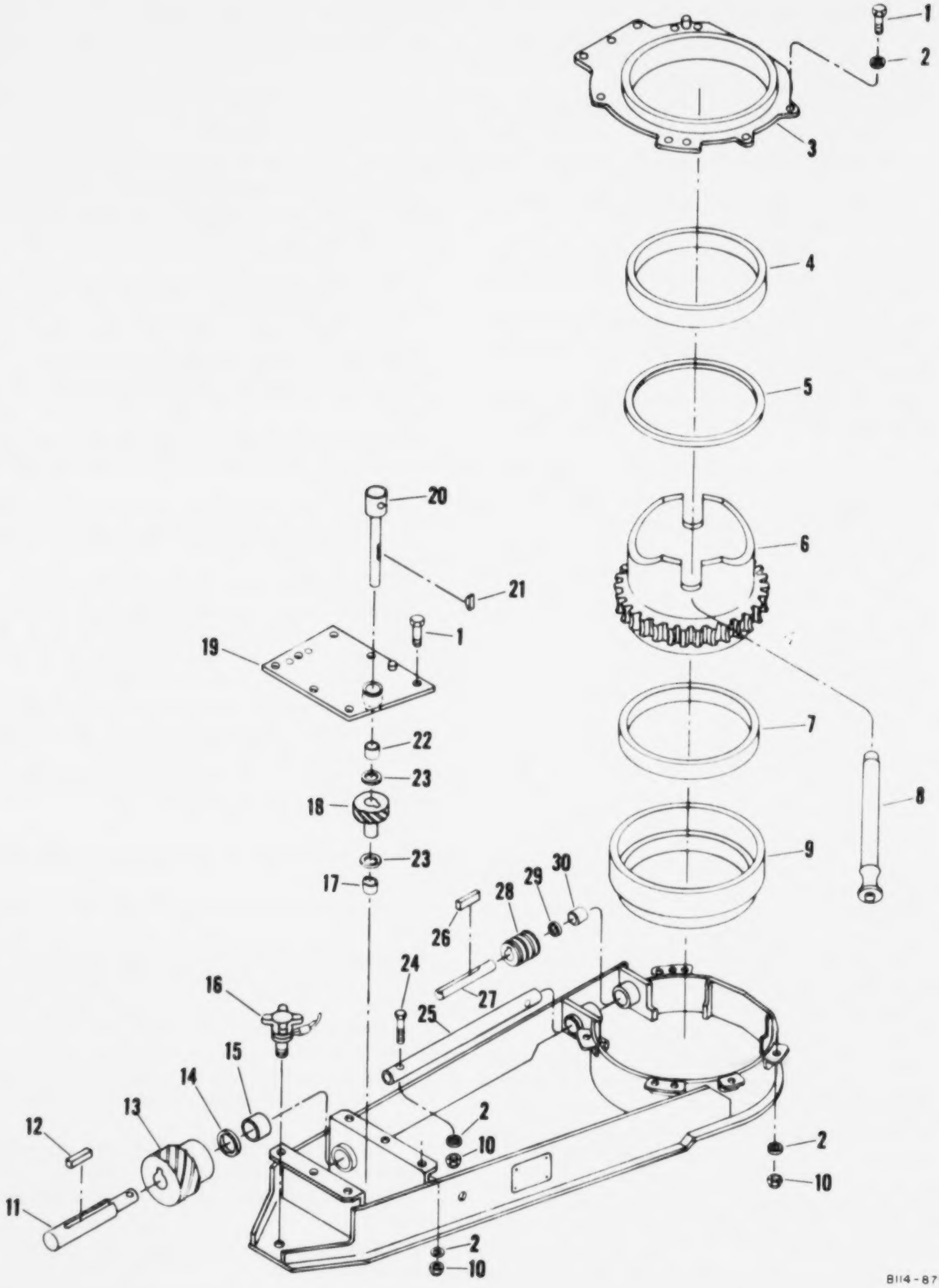
e. Remove pulley guide pins (10 and 24) from trolley. Feed trolley cable (14) thru slot in trolley.

f. Remove both trolley stops from boom. Remove trolley (21).

g. Remove nut (9) and washer (8). Remove defective cam follower (22).

h. Install new cam follower (22) on trolley with washer (8) and nut (9).

i. Slide trolley (21) onto boom and install trolley stops.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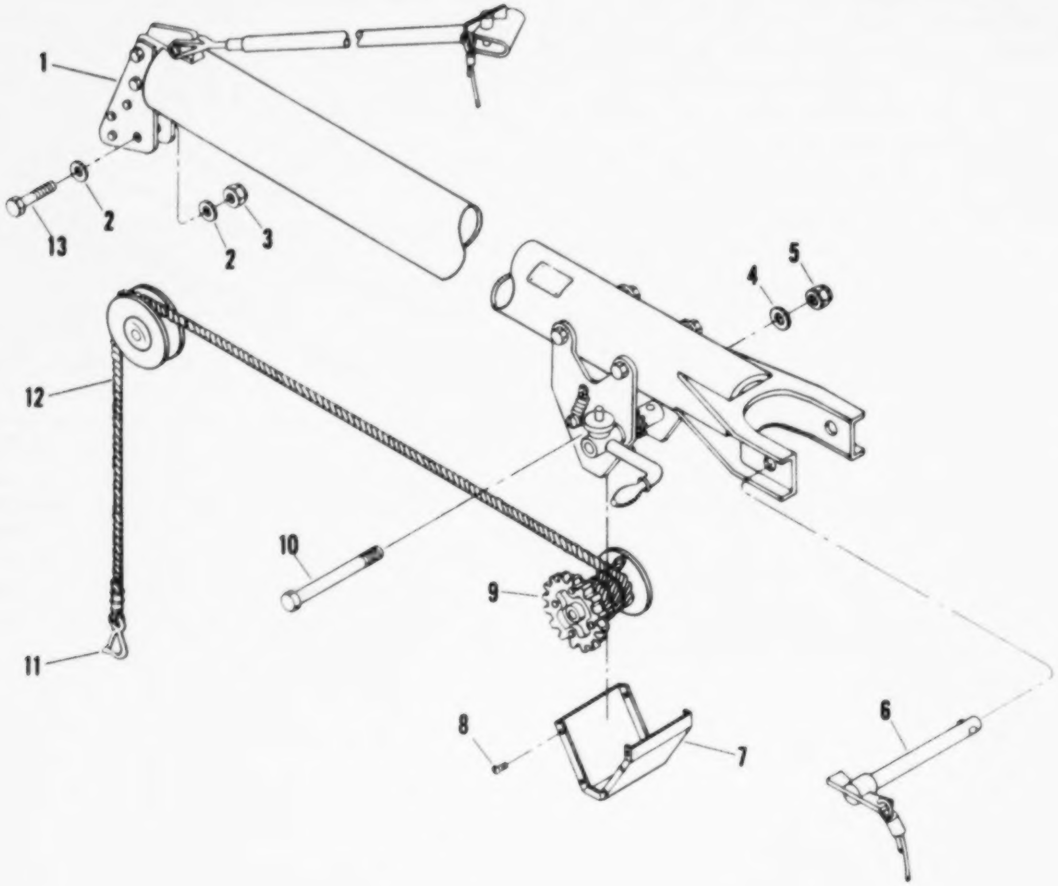
8114-879-34J

Figure 1-42. Maintenance Crane Azimuth Drive



42 x 35

B114-880-34J

1. Support plate
2. Washer
3. Nut
4. Washer
5. Nut
6. Quick-release pin
7. Cover
8. Screw
9. Drum and gear assembly
10. Bolt
11. Hook
12. Nylon rope
13. Bolt

Figure 1-43. Maintenance Crane Jib Boom Assist

Legend for figure 1-42

1. Bolt
2. Washer
3. Worm gear assembly cap
4. Bearing
5. Spacer
6. Worm gear
7. Bearing
8. Quick-release pin
9. Bearing
10. Nut
11. Shaft
12. Key
13. Helical gear
14. Thrust bearing
15. Bearing
16. Captive screw
17. Bearing
18. Helical gear
19. Helical gear assembly cap
20. Pinion shaft
21. Key
22. Bearing
23. Thrust bearings
24. Bolt
25. Shaft connector
26. Key
27. Shaft
28. Worm
29. Thrust bearing
30. Bearing

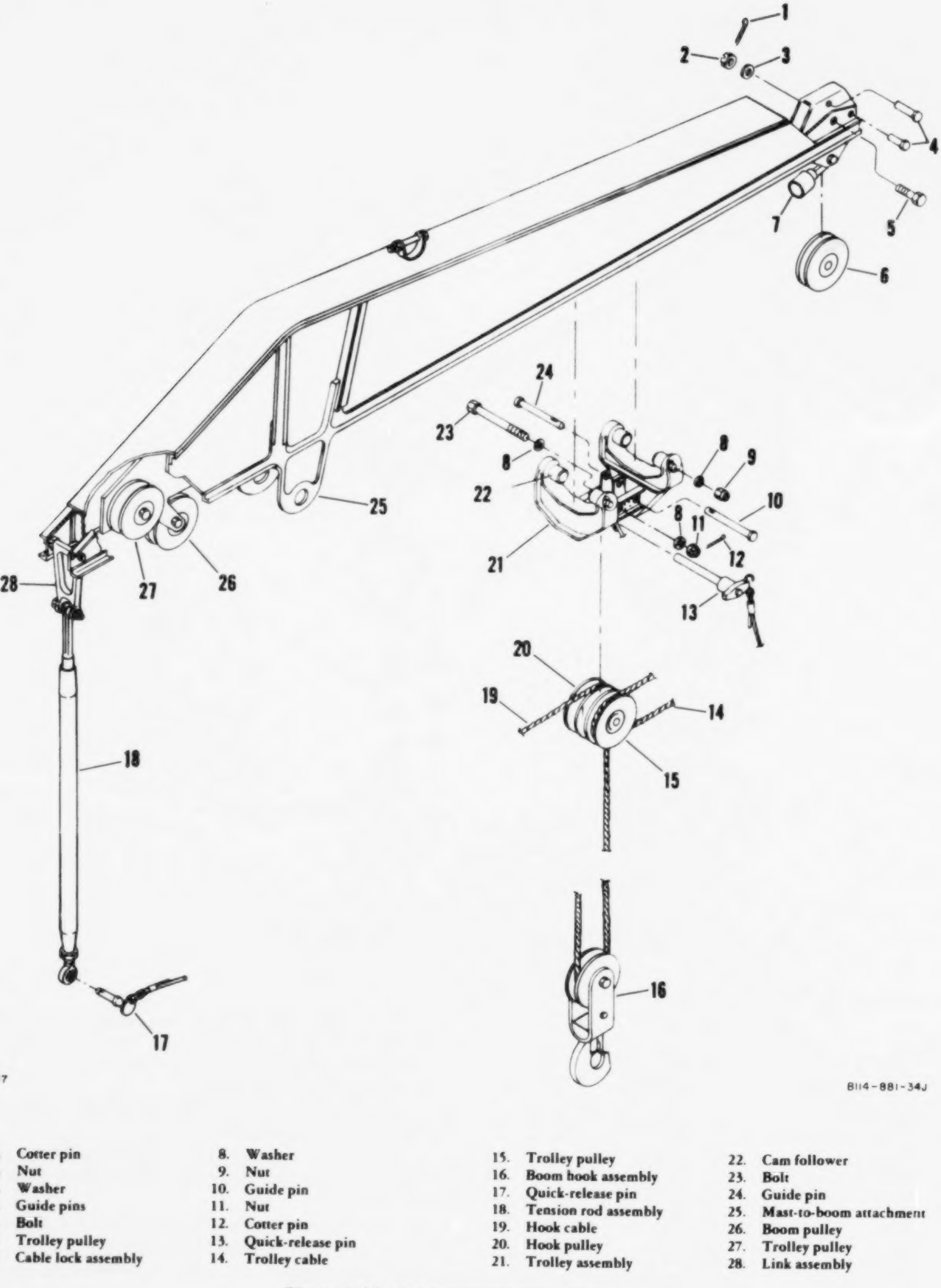
j. Pass trolley cable (14) over and around trolley pulley (15) and thru slot in trolley housing. Pass hook cable (19) around hook pulley (20) and install pulley guide pins (10 and 24) in trolley housing (21).

k. Pass hook cable (19) under boom hook pulley (16) and install pulley guide pins.

l. Slide cable lock barrel (7) over trolley cable (14). Place trolley cable in cable lock (7) and tighten barrel on lock.

m. Position hook cable (19) in trolley (21). Align the holes, and install quick-release pin (13).

n. Visually inspect the cable installation for proper reeving.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42 X 47
BII4-881-34J

1. Cotter pin	8. Washer	15. Trolley pulley	22. Cam follower
2. Nut	9. Nut	16. Boom hook assembly	23. Bolt
3. Washer	10. Guide pin	17. Quick-release pin	24. Guide pin
4. Guide pins	11. Nut	18. Tension rod assembly	25. Mast-to-boom attachment
5. Bolt	12. Cotter pin	19. Hook cable	26. Boom pulley
6. Trolley pulley	13. Quick-release pin	20. Hook pulley	27. Trolley pulley
7. Cable lock assembly	14. Trolley cable	21. Trolley assembly	28. Link assembly

Figure 1-44. Maintenance Crane Boom

1-110. Replacement of the Mast-to-Boom Swivel Attachment Spacers. (See fig. 1-45.)

a. Remove cotter pin (13), nut (12), and washers (8) from swivel attachment bolt (7).

b. Remove the bolt slowly and catch washers (9 and 10) as they fall.

c. Raise boom so swivel attachment clears mast and remove spacers (11).

d. (See fig. 1-44.) Temporarily secure boom so mast-to-boom swivel attachment (25) clears mast.

e. (See fig. 1-45.) Place short spacer between swivel attachment legs. Slide long spacer thru swivel attachment and thru short spacer.

f. (See fig. 1-44.) Lower boom and align swivel attachment and mast attaching holes.

g. (See fig. 1-45.) Install special washer (8) under bolt head (7). Slide bolt into mast.

h. Install two washers (9 and 10) between mast and swivel attachment legs and slide bolt (7) thru spacers until it reaches the opposite swivel attachment leg.

i. Install two shims between opposite swivel attachment leg and mast. Slide the bolt all the way thru assemblies.

j. Install washer (8), nut (12), and cotter pin (13) on bolt (7).

1-111. Replacement of the Cable and Drum. Replacement of either cable drum is similar. Therefore, only one assembly will be covered. Replace hook or trolley drum and cable assemblies as follows:

a. Run either cable out as follows:

(1) To run out trolley cable, wind the trolley winch OUT until no cable wraps are on trolley winch drum.

(2) To run out hook cable, remove the quick-release pin from the hook winch handle. Pull down on hook cable until cable is run out completely.

b. (See fig. 1-45.) Remove 20 bolts (4) securing trolley winch side plate (1) to the mast.

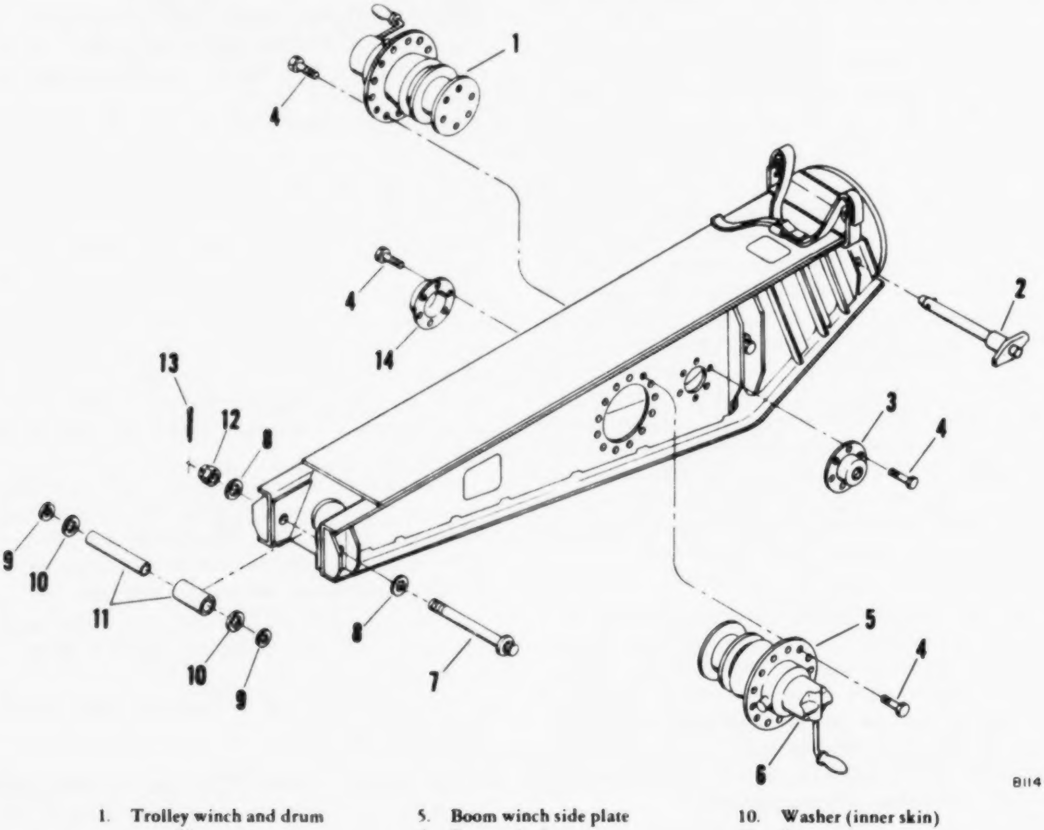
c. Remove the trolley winch from the mast.

d. Pull trolley drum and cable thru the winch access hole. Remove the bolt securing the cable eye to the drum.

e. Remove the four setscrews from the cable retainer. Remove the drum.

f. (See fig. 1-44.) Remove the hook cable or trolley cable as follows:

(1) To remove hook cable (19), remove pulley guide pins from hook (16), trolley (21), and lower inboard pulley (26) bracket. Remove quick-release pin (13) from trolley (21) and pull hook cable thru and out of the boom.



1. Trolley winch and drum assembly
2. Quick-release pin
3. Trolley winch hub
4. Bolt
5. Boom winch side plate
6. Boom winch
7. Bolt
8. Washer
9. Washer (outer skin)
10. Washer (inner skin)
11. Spacer
12. Nut
13. Cotter pin
14. Boom winch hub

Figure 1-45. Maintenance Crane Mast

(2) To remove trolley cable, remove pulley guide pins from trolley (21), outboard boom pulley (6) bracket, and inboard boom pulley (27). Release cable at cable lock (7) and pull cable thru and out of the boom.

NOTE

To facilitate cable removal and installation, attach a piece of cord to the cable eye prior to removal. When the cable is removed, detach it from the cord. To install the cable, tie the cord to the cable eye and pull the cord.

g. Install the hook cable or trolley cable as follows:

(1) To install the hook cable, pass cable over hook pulley (20), along underside of the boom and over lower inboard boom pulley (26). Install pulley guide pins.

(2) To install trolley cable, pass cable under and around trolley pulley (15), around outboard boom pulley (6), thru boom, and over inboard boom pulley (27). Install pulley guide pins.

h. Guide either cable thru the mast and out the respective winch access hole.

i. Position the cable in the drum cutout, and install cable retainer. Install bolt thru cable eye into drum.

j. (See fig. 1-45.) Install drum and winch (1). Align winch side plate with guide pins. Align winch drive shaft and install and tighten bolts in side plate.

k. Operate the winch. Make sure cable follows the drum cable grooves.

SECTION IV INSPECTION

1-112. General Information.

This section contains complete requirements for special inspections, overhaul and retirement schedule, and standards of serviceability applicable to the aircraft. The inspections prescribed in this chapter shall be accomplished at specified periods by aviation unit maintenance activities when required. Complete Daily, Inspection Checklist (TM 55-1520-227-PMD) and Phased Maintenance Checklist (TM 55-1520-227-PM). Observe the following conditions when performing inspections:

a. The inspection requirements are stated in such a manner as to establish what and when certain equipment is to be inspected and the condition to be sought. Compliance with the provisions outlined herein and with the Daily and Phased Maintenance checklists is required in order to ensure that latent defects are discovered and corrected before malfunctioning or serious trouble results. In order to arrange inspection requirements as nearly as possible according to the manner in which work will be assigned, the requirements in each section are divided into groups under area headings. (See fig. 1-46.) An area title indicates a specific aircraft location which may be comprised of several systems or groups of related components within this given area.

b. Inspection methods employed, environmental and geographical conditions, availability of specialized, skilled, or semi-skilled manpower, and facilities utilized are extremely variable. Therefore, flexibility is provided with respect to the order of performance of the various inspections as required by efficient management of the inspection function assuring that the inspection requirements designated are adhered to and accomplished.

c. This manual pertains to all CH-47B and CH-47C series aircraft. Therefore, it may contain inspection requirements applicable to specific equipment not installed on individual aircraft. When this situation is encountered, disregard those requirements that are not applicable.

d. The inspection requirements are printed on inspection checksheets. They are to be locally reproduced and used while performing the pertinent inspections.

1-113. Standards of Serviceability.

Standards of serviceability to be utilized in the day-to-day inspection and maintenance of the aircraft can be found as fits, tolerances, wear limits and specifications in the aircraft maintenance manuals. Standards of serviceability for transfer of aircraft are contained in TM 55-1500-326-25.

1-114. Special Inspection.

1-115. Definition and General Information. This section supplements the scheduled inspections as outlined in the Daily and Phase Maintenance checklists. This section also includes inspection of items which are required to be inspected at intervals not compatible with airframe operating time or airframe inspection intervals. Refer to TM 38-750 for applicable forms, records, and worksheets required for these inspection intervals. Typical of this type inspection items are:

a. An inspection which is contingent upon specific conditions or incidents that arise, and only because of these conditions or incidents. Immediate inspection is required to ensure safe flight. Typical of these conditions are hard landings, overspeed, and sudden stoppage.

b. Inspection of components or airframe on a calendar basis: first aid kits, weight and balance check, aircraft inventory, etc.

c. Refer to TM 38-750 for applicable forms, records, and worksheets.

1-116. Requirements. The requirements include items which qualify under the criteria in para 1-115, such as hard landings, sudden stoppage, overspeed, etc. These requirements are grouped under area headings only and shall be inserted in a columnar listing on the Inspection Checksheet format, in such a manner as to permit local reproduction of the entire section in the field.

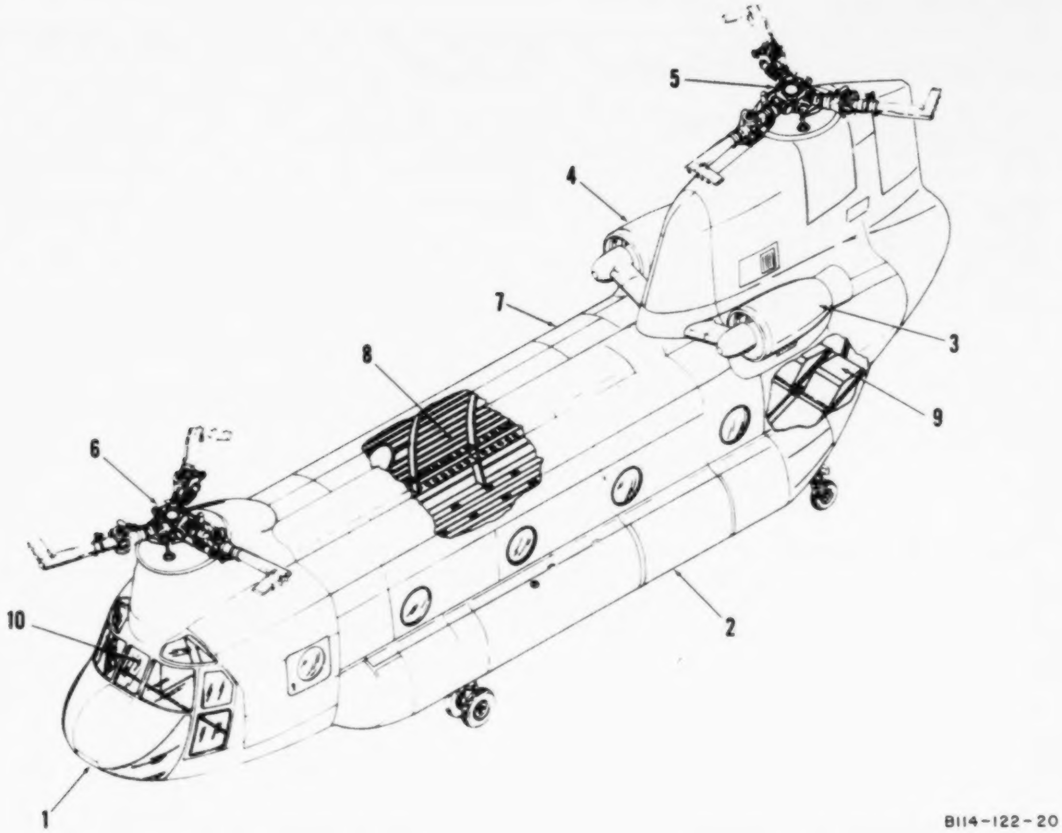


Figure 1-46. Inspection Areas

AREA No. 1:	Nose Area	External area of fuselage, from sta 120 RH to sta 120 LH, excluding Area No. 6.
AREA No. 2:	Left Fuselage Area	External area of fuselage, from sta 120 aft to sta 630.5, including bottom of fuselage, excluding Areas No. 5 and No. 6.
AREA No. 3:	No. 1 Engine Area	No. 1 engine, engine and transmission covers (cowling).
AREA No. 4:	No. 2 Engine Area	No. 2 engine, engine and transmission covers (cowling).
AREA No. 5:	Aft Rotor and Pylon Area	Internal and external area of upper fuselage, from sta 630.5 forward to sta 440, excluding Areas No. 2 and No. 7.
AREA No. 6:	Forward Rotor, Crown, and Tunnel Area	Internal and external area of upper fuselage from sta 440 forward to sta 62, excluding Areas No. 1, No. 2, and No. 7.
AREA No. 7:	Right Fuselage Area	External fuselage, from sta 630.5 forward to sta 120 including bottom of fuselage, excluding Areas No. 5 and No. 6
AREA No. 8:	Cabin Area	Internal area of fuselage, from the cockpit entrance at approximately sta 95 aft to sta 482.
AREA No. 9:	Ramp Area	Internal area of fuselage, from sta 482 aft to sta 630.5
AREA No. 10:	Cockpit Area	Internal area of fuselage, from the cockpit entrance at about sta 95 fwd to sta 21.5

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 1	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
ALL		**PRIOR TO TRANSFER AND IMMEDIATELY UPON ASSIGNMENT OF AIRCRAFT**		
		a. Accomplish standards of serviceability requirements. (Refer to TM 55-1500-326-24.)		
		b. Perform an inventory check. (Refer to DA Form 2408-17 and Appendix C.)		
ALL		**WHEN OVERHAULS, MAJOR MODIFICATIONS OR MAJOR AIRFRAME REPAIRS ARE ACCOMPLISHED, ANY SPECIAL EQUIPMENT HAS BEEN ADDED TO OR REMOVED FROM THE BASIC AIRFRAME OR WHEN WEIGHT AND BALANCE DATA ARE SUSPECTED TO BE IN ERROR**		
		Weigh the aircraft and perform weight and balance records check. (Refer to TM 55-405-9.)		
ALL		**INSPECTION PHASE PRIOR TO EXPIRATION OF 24 MONTHS SINCE LAST WEIGHT AND BALANCE CHECK**		
		Weigh the aircraft and perform weight and balance records check. (Refer to TM 55-405-9.)		
ALL		**WHEN WATER LANDINGS HAVE BEEN PERFORMED, AFTER THE LAST FLIGHT OF THE DAY**		
		a. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on underside of fuselage (chapter 2). Close valves after draining.		
		b. Lower cockpit enclosures for cracks.		
		c. Landing-searchlights and lower anticollision light for cracked lenses.		
		d. Underside antennas for damage and security.		
		e. Ramp hinge cover for damage.		
		f. Purge pitot static and SAS yaw sensing systems.		

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		g. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.)		
		h. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than 3 days after the initial water landing (chapter 3).		
ALL		**WHEN SALT WATER SPRAY IS ENCOUNTERED OR SALT WATER LANDINGS HAVE BEEN PERFORMED (AFTER THE LAST FLIGHT OF THE DAY)**		
		a. Perform special inspection when water landings have been performed.		
		b. Wash the aircraft (chapter 1).		
		c. Clean engines. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
		d. Clean the apu compressor. (Refer to TM 55-2835-203-24.)		
ALL		**UPON COMPLETION TO ANY INSPECTION OF MAINTENANCE**		
		Inspect all work areas for loose hardware, tools, rags, and other foreign matter. Give particular attention to the top of the aircraft and to the engine inlet fairings.		
2 & 7		**WHEN AN AIRCRAFT HAS BEEN WASHED OR SUBJECTED TO HEAVY RAIN OR ICING, AFTER WATER LANDINGS, AND AFTER INTERIOR WASHING**		
		a. Synchronizing drive shaft for water (chapter 6).		
		b. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on the underside of fuselage (chapter 2). Close valves after draining.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
2 & 7	**WHENEVER LANDING GEAR WHEELS HAVE BEEN REMOVED**	Clean and visually inspect wheels for cracks, damage, corrosion, and deterioration of finish.		
2 & 7	**WHENEVER LANDING GEAR WHEELS HAVE BEEN SUBMERGED IN WATER OR MUD**	a. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.) b. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than 3 days after the wheels were submerged (chapter 3).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		c. Inspect and clean heater drain line.		
		WHEN AN AIRCRAFT HAS BEEN SUBJECTED TO A HARD LANDING OR WHEN EMERGENCY EXIT LIGHTS (IF INSTALLED) ARE ACTUATED DURING LANDING		
2 & 7		a. Landing gear attachment fittings for misalignment and cracks.		
		NOTE ***When hard landing inspection shows misalignment or cracks in landing gear, or distortion and/or loose or missing rivets in supporting frames or skin, inspect the following:*** ***1. Wheels (disassembled) for cracks. Fluorescent penetrant inspect wheel castings, welded areas, axles, and attaching bolts. Wheel bearings for condition.*** ***2. No. 1 and No. 2 engine supports for cracks (fluorescent penetrant inspect).*** ***3. Ramp for proper operation and alignment of pins in sockets.*** ***4. Fuel cells and components for damage and loose attachment fittings (pod lowered).***		
2 & 7		b. Support frames and skin (internal and external) for distortion.		
5 & 8		c. Fuselage and transmission support members for cracks and distortion.		
3 & 4		d. No. 1 and No. 2 engine support structure for cracks, distortion, and loose rivets.		
3 & 4		e. Perform excessive G-Load inspection on engines. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		f. Engine mounting pads for cracks and loose bolts.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
9		g. Apu support structure for cracks, distortion, and loose rivets.		
2 & 7		h. Wheels for cracks (fluorescent penetrant inspect).		
2 & 7		i. Shock struts for leakage and distortion.		
2 & 7		j. Shock strut mount fittings for cracks (fluorescent penetrant inspect).		
2 & 7		k. Tires for damage.		
5 & 6		l. Droop stops and hub for distortion.		
1,5,		m. Dynamic absorbers support structure for cracks, distortion, and loose rivets.		
2 & 7		n. Fuel pod support structure for cracks and distortion.		
2 & 7		o. Perform inspection on crash resistant fuel system (chapter 10).		
2 & 7	**WHENEVER SKIS ARE INSTALLED**			
		a. Daily - Axle shaft attaching points, trailing wheel and attaching points, and spring actuator attaching points for security.		
		b. Every 25 hours - Ski (around wheel well) for cracks and delamination. Bungee cords and guide lines for condition and security, Lubricate 3 fittings per ski with grease (C164).		
ALL	**WHENEVER THE HELICOPTER OR ROTARY WING BLADE IS STRUCK BY LIGHTING**			
		a. Perform a lightning strike inspection (chapter 2 and 5).		
		b. Remove, condemn, and locally scrap the affected blade (metal blades).		
		c. Visually inspect rotor blades for unbounding of jumpers and any visual arc burns. Repair/replace blade if these conditions are found (fiberglass blades).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3 & 4		**WHENEVER AN ENGINE IS DROPPED DURING HANDLING** Perform an engine dropped inspection. (Refer to TM 55-2840-234-24/2, or TM 55-2840-249-23.)		
3 & 4		**WHENEVER ENGINE OIL CONSUMPTION EXCEEDS 2 QUARTS PER HOUR** Perform a hot end inspection and a high oil consumption check at the next inspection phase. (Refer to TM 55-2840-234-24/2, TM 55-2840-249-23, or TM 55-2840-254-23.)		
3 & 4		**WHENEVER AN ENGINE IS SUBJECTED TO SUDDEN STOPPAGE OR A SUDDEN REDUCTION IN RPM** Perform an overtorque inspection. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		**WHEN AN ENGINE OVERTEMPERATURE IS EXPERIENCED AS SPECIFIED IN TM 55-1520-227-10-1 or -2** Perform a hot end inspection. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		**WHEN AN ENGINE N2 OVERSPEEDS AS SPECIFIED IN TM 55-1520-227-10-1 or -2** a. Compute to find if actual overspeed occurred (chapter 4). b. If overspeed occurred, perform an overspeed inspection. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		**WHEN AN ENGINE COMPRESSOR STALL (SURGE) IS EXPERIENCED** Perform compressor stall inspection. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5 & 8		c. Fuselage and transmission support members for cracks and distortion.		
3 & 4		d. No. 1 and No. 2 engine support structure for cracks, distortion, and loose rivets.		
3 & 4		e. Perform excessive G-Load inspection on engines. (Refer to TM 55-2840-234-24/1 or -24/2.)		
3 & 4		f. Engine mounting pads for cracks and loose bolts.		
9		g. Apu support structure for cracks, distortion, and loose rivets.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3 & 4		**AT TIME OF ENGINE REMOVAL FOR ANY REASON**		
		a Forward airframe support engine mount lugs (visually) for cracks, nicks, scratches, and elongated holes.		
3 & 4		b Remove the bolts through the spherical bearings. Remove the slip fit bushings and the spherical bearings (do not remove the press fit bushings). Dye penetrant inspect forward airframe support engine mount lugs. Check all parts for wear (chapter 4). Not required if it has been performed in the last 600 hours of aircraft operation.		
3 & 4		c. Retorque fwd engine mount bolts after first flight. Do not exceed four flight hours.		
		d. Functionally check the engine oil low level warning system (chapter 4).		
		e. Inspect aft connecting link bearings for looseness.		
		f. Remove drag brace forward attaching bolt. Inspect bolt and attaching hardware for wear.		
3 & 4		**WHEN AN ENGINE CONDITION CONTROL SYSTEM COMPONENT IS REPLACED OR REINSTALLED (T55-L-7 SERIES ENGINES ONLY).** Perform a turbine engine analysis check (TEAC) (chapter 4).		
4		**WHENEVER No. 2 ENGINE IS REPLACED OR REINSTALLED** Immediately following No. 2 engine operation, perform operational check on flight control pneumatic system.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3 & 4		**WHENEVER AN ENGINE, ENGINE TRANSMISSION, COMBINING TRANSMISSION, OR ENGINE DRIVE SHAFT HAS BEEN DISCONNECTED, REINSTALLED, OR REPLACED OR WHENEVER EXCESSIVE ENGINE DRIVE SHAFT VIBRATION IS SUSPECTED (ON CH-47C AIRCRAFT WITH T55-L-11A OR-L55-L-11ASA ENGINES ONLY)** Perform an engine drive shaft vibration test (chapter 4)		
3 & 4		**WHENEVER A NEW OR OVERHAULED OR PERMANENT STORAGE ENGINE IS INSTALLED** Perform activation check run on the engine. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		**WHEN STARTING, BEEPING OR ADVANCING CONDITION LEVER TO FLIGHT, IF LOUD NOISES OR SHOCKS ARE FOLLOWED BY SUDDEN HIGH INCREASES IN ENGINE TORQUE, IF AN ENGINE FAILS TO ENGAGE, OR IF A TORQUEMETER IS STATIONARY AT HIGH VALUE AFTER SHUTDOWN.** Do not restart affected engine. Troubleshoot engine and engine control system. If cause cannot be determined, replace affected engine and engine transmission.		
3 & 4		**WHENEVER A ROTATING GAS PRODUCER COMPONENT OR POWER TURBINE ASSEMBLY IS REPAIRED OR REPLACED OR IF EXCESSIVE ENGINE VIBRATION IS SUSPECTED** Perform engine vibration check. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.)		
3 & 4		**WHENEVER A CONE ASSEMBLY (TAILPIPE) IS INSTALLED OR REPLACED ON T55-L-11 OR -712 ENGINES.** After initial engine ground run retorque coupling nuts 25 to 30 pound-inches.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3 & 4		**WHENEVER CO2 IS APPLIED TO THE ENGINE.** a. If CO2 is applied into the air inlet while the engine is hot or rotating, perform a hot end inspection. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.) Inspect the area subjected to CO2 for cracks. b. If CO2 is applied into the tailpipe or other engine areas while the engine is hot or rotating, inspect the area subjected to CO2 for cracks.		
3 & 4		**WHENEVER EMERGENCY POWER REACHES 30 MINUTES CUMULATIVE TIME. (CH-47C WITH T55-L-712 ENGINES ONLY)** Perform engine hot end inspection. Record number of hot end inspections on DA FORM 2408-15. Record the computed elapsed time spent in emergency power on DA FORM 2408-15. Record cumulative engine emergency power minutes, time since last hot end inspection, and total engine operating hours on DA FORM 2408-15.		
3 & 4		**WHENEVER THE HELICOPTER IS OPERATED WITHIN 200 MILES OF VOLCANIC ACTIVITY** Wash engines with clean water after last flight of the day.		
3 & 4		**WHENEVER THE HELICOPTER IS OPERATED WITHIN 10 MILES OF SALT WATER OR WITHIN 1000 FEET OF ITS SURFACE** Wash engines with clean water after last flight of the day.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3,4, &9		**WHEN AN ENGINE FIRE EXTINGUISHER SYSTEM IS ACTUATED** Inspect lines for security. Purge all valves, tees, and tubing (chapter 12).		
3,4, & 10		**WHENEVER ENGINE OR TIMER/EMERGENCY POWER PANEL IS REMOVE/INSTALLED** Record the total reading on the digital timer for the installed engine on DA FORM 2408-15. Record next hot end inspection due on DA FORM 2408-18. Reset the black and white indicator flag using switch in nose compartment while helicopter is on ground.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3,4,5, 6 & 9		**WHENEVER STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR 10 SECONDS OR MORE (CH- 47B ONLY)**		
		a. Replace engine transmission if 860 pound-feet is exceeded on that transmission.		
		b. Replace combining transmission if 860 pound-feet is exceeded on either engine.		
		c. Inspect engine if 1,050 pound-feet is exceeded on that engine. (Refer to TM 55-2840-234-24/2.)		
		d Replace forward and aft transmissions (114D1001 and 114D2001 series) if 1,720 pound-feet total from both engines is exceeded.		
		e Replace fwd and aft transmissions (114D1200 and 114D2200) if 2030 pound-feet total from both engines is exceeded.		
3,4,5, 6 & 9		**WHENEVER NEVER EXCEED TORQUE LIMITS HAVE BEEN EXCEEDED (CH-47B ONLY)**		
		a. Replace engine transmission if 1,200 pound-feet is exceeded on that transmission.		
		b. Replace combining transmission if 1,200 pound-feet is exceeded on either engine.		
		c. Replace forward and aft transmissions (114D1001 and 114D2001 series) if 2,400 pound-feet total from engines is exceeded.		
		d. Replace forward and aft transmissions (114D1200 and 114D2200 series) if 2,600 pound-feet total from both engines is exceeded.		
		e. Inspect engine if 1,300 pound-feet is exceeded on that engine. (Refer to TM 55-2840-234-24/2.)		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3,4,5, 6 & 9		**WHENEVER STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR 10 SECONDS OR MORE (CH-47C WITH T55-L-7C ENGINES)** a. Replace any engine transmission if 1,300 pound-feet is exceeded on that engine. b. Replace the combining transmission if 1,300 pound-feet is exceeded on either engine. c. Inspect engine if 995 pound-feet is exceeded on that engine. (Refer to TM 55-2840-249-23.) d. Replace forward and aft transmission if 2,030 pound-feet total from both engines is exceeded.		
3,4,5, 6 & 9		**WHENEVER NEVER EXCEED TORQUE LIMITS HAVE BEEN EXCEEDED (CH-47C WITH T55-L-7C ENGINES)** a. Inspect engine if 1300 pound-feet is exceeded on that engine. (Refer to TM 55-2840-249-23.) b. Replace the forward and aft transmissions if 2600 pound-feet from both engines is exceeded.		
3,4,5, 6 & 9		**WHENEVER AN ENGINE, AFT ROTOR SHAFT, OR TRANSMISSION IS INSATLLED** Functionally check applicable chip detector (power on).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3,4,5, 6 & 9		**WHENEVER NEVER EXCEED TORQUE LIMITS HAVE BEEN EXCEEDED CH-47C WITH T55-L-11 or T55-L-712 ENGINES)**		
		a. Replace any engine transmission if 138% torque is exceeded on that transmission.		
		b. Replace the combining-transmission if 138% torque is exceeded on either engine.		
		c. Inspect any engine if 150% torque is exceeded on that engine. (Refer to TM 55-2840-254-23 or TM 55-2840-234-24/1.)		
		d. Replace the forward and aft transmissions if 200% total torque from both engines is exceeded.		
3,4,5, 6 & 9		**WHENEVER STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR 10 SECONDS OR MORE (CH-47C WITH T55-L-11 or T55-L-712 ENGINES)**		
		a Replace any engine transmission if 100% torque is exceeded on that transmission.		
		b. Replace the combining transmission if 100% torque is exceeded on either engine.		
		c. Inspect T55-L-11 engine if 138% torque is exceeded on that engine. (Refer to TM 55-2840-234-24/1.)		
3 & 4		d. Inspect T55-L-712 engine if 150% torque is exceeded on that engine. (Refer to TM 55-2840-254-23.)		
		e. Replace the forward and aft transmissions if 168% total torque from both engines is exceeded.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5&6		WHENEVER A TRANSMISSION IS DROPPED DURING HANDLING. Refer to Dropped Transmission Inspection (para 6-2.1).		
5 & 6		**WHENEVER AN ENGINE AFT ROTOR SHAFT OR TRANSMISSION IS INSTALLED** Functionally check applicable chip detector, power on.		
5		**WHENEVER AN ENGINE TRANSMISSION OIL TEMPERATURE EXCEEDS 130°C FOR MORE THAN 1 HOUR OR EXCEEDS 140°C (NEVER EXCEED)** a. Functionally check the affected oil temperature indicating system (chapter 8). b. If the indicating system is satisfactory, replace the engine transmission (chapter 6). c Determine the cause of overheating (chapter 6).		
5		**WHEN AN ENGINE TRANSMISSION IS REMOVED** a. Check the quill shaft for condition (chapter 6). b. Check engine power output shaft seal and seal housing for oil leaks. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.) c. Check engine power output shaft splines for condition. (Refer to TM 55-2840-234-24/2 or TM 55-2840-249-23.) d. Clean and lubricate output shaft and mating drive shaft adapter splines. e. Inspect the quill shaft nylon snubber. If snubber is cracked, distorted or disconnected from the shaft shoulder, replace . If snubber is disintegrated, replace the engine transmission (chapter 6).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3,4,5, 8 & 9		**WHENEVER AN ENGINE AFT ROTOR SHAFT OR TRANSMISSION CHIP DETECTOR IS REMOVED** Check the residual magnetism of the detector. If the detector will not support the weight of a 1/4-28 thread steel nut or equivalent, replace the detector.		
5&6		PRIOR TO INSTALLATION OF A FORWARD OR AFT TRANSMISSION a. Inspect transmission sump screen and screen cavity in the sump for corrosion (chapter 6). b. Check historical records to determine date of last overhaul. If date of overhaul was between May 82 and Jan 85 or cannot be determined, perform spiral bevel gear inspection every 100 hours. For all other dates, perform spiral bevel gear inspection every 300 hours.		
5 & 6		PRIOR TO INSTALLATION OF A FORWARD, AFT, OR COMBINING TRANSMISSION (MRB ONLY) Inspect identification plate to insure the letters "FO" are stamped on the plate. If "FO" does not appear on the plate, the transmission is unserviceable.		
6		**WHEN A FORWARD TRANSMISSION IS REPLACED OR REINSTALLED** a. Phase the rotary-wing system (chapter 6). b. Perform a neutral rig check (chapter 11). c. Clean and lubricate input shaft and drive shaft adapter splines. d. Inspect installation of lubrication hose assemblies (refer to figure 6-66)		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		**WHEN AN AFT ROTARY-WING DRIVE SHAFT THRUST BEARING LUBRICATION FILTER, TUBE, HOSE, OR FITTING HAS BEEN DISCONNECTED, REPLACED OR REINSTALLED** Perform an oil flow check at thrust bearing oil return line (chapter 6).		
5 & 6		**WHEN AN AFT ROTARY-WING DRIVE SHAFT IS REPLACED OR REINSTALLED** a. Phase the rotary-wing system (chapter 6). b. Perform a neutral rig check (chapter 11).		
5 & 9		**WHEN AN AFT TRANSMISSION IS REPLACED OR REINSTALLED** a. Inspect generator (31220-002 only) brushes for serviceable condition (chapter 9). b. Inspect No. 2 aft shaft for proper indexing (chapter 6).		
5 & 9		**WHENEVER AN AC GENERATOR SHAFT IS SHEARED** a. If generator has failed internally, replace generator only. b. If generator has not failed internally, replace the aft transmission.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		c. Check rotary-wing system for proper phase relationship (chapter 6).		
		d. Clean and lubricate drive shaft adapter splines.		
5		WHENEVER CONTAMINATION IS FOUND IN COMBINING OR ENGINE TRANSMISSION FILTERS		
		a. Perform a contamination analysis and serviceability check (chapter 6).		
		b. Inspect No. 1 and No. 2 engine transmission oil line screens (2) or debris indicating screens for contamination (chapter 6).		
		c. Functionally check the debris indicating screen electrical circuitry for proper operation (chapter 6).		
5		WHEN A COMBINING TRANSMISSION IS REPLACED, REMOVED OR REINSTALLED		
		a. Phase the rotary-wing system (chapter 6).		
		b. Clean and lubricate all engine drive shaft adapter splines, input shaft splines, and forward drive shaft adapter splines.		
		c. Check to make sure transmission temperature cable plugs (3 each) are connected to their respective transmission temperature bulbs.		
		d. Inspect hydraulic lines for chafing, particularly inside phenolic assemblies. Make sure lines are secure (chapter 6).		
5,6,8, & 9		WHENEVER A TRANSMISSION LUBRICATION SYSTEM HAS BEEN CONTAMINATED WITH HYDRAULIC FLUID		
		Perform an oil system contamination inspection (chapter 6).		
5,6, & 9		WHEN A FORWARD, AFT, COMBINING, OR ENGINE TRANSMISSION IS REPLACED		
		Remove, inspect, and clean the applicable transmission inline oil strainers (chapter 6).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5,6,8,		**WHEN A TRANSMISSION, AFT ROTOR SHAFT, OR TRANSMISSION OIL COOLER IS REPLACED OR IS INACTIVE FOR MORE THAN 30 DAYS** a. After 30-minutes ground run at normal rotor RPM and prior to first flight, remove and inspect the applicable filter(s) for contamination. b. After first flight, inspect applicable filter(s) for extended indicator buttons.		
5,6, 8 & 9		**WHEN CONTAMINATION IS FOUND ON A TRANSMISSION OR AFT ROTARY-WING DRIVE SHAFT CHIP DETECTOR OR OIL FILTER** a. Check the quantity, source, form, and type of material. Determine serviceability or necessity for replacement of component (chapter 6). b. If component is an engine or combining transmission, inspect the applicable debris indicating screen for contamination and for proper operation of electrical circuitry (chapter 6).		
5		**WHEN AN AFT TRANSMISSION HAS BEEN REPLACED DUE TO METAL CONTAMINATION** Remove, inspect, and clean aft rotary-wing drive shaft filter and chip detector. If the chip detector is contaminated, replace the aft rotary-wing drive shaft. Upon reinstallation of the filter, make sure the oil line is connected to the filter (chapter 6).		
5,6, 8 & 9		**WHEN A TRANSMISSION IS BEING REMOVED BECAUSE OF A SUSPECTED INTERNAL FAILURE AND THE OIL FILTER OR CHIP DETECTOR SHOWS SIGNS OF METAL CONTAMINATION** If the filter shows signs of being bypassed or if a filter warning indicator is extended, flush the applicable system lines and hoses with solvent (C137) and replace the oil cooler. Inspect pump filter for open bypass valve everytime aft transmission oil filter is removed.		
5 & 6		**FORWARD AND AFT TRANSMISSIONS IDENTIFIED WITH SERIAL NUMBER SUFFIX "S" REQUIRE SPECIAL DEPOT LEVEL INSPECTIONS WHEN OPERATED IN CH-47C AIRCRAFT WITH T55-L-11 SERIES ENGINES AS FOLLOWS:** a. 114D1200-5 thru -9: every 500 hours of operation. b. 114D2200-7 thru -11: every 300 hours of operation.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5,6, 8 & 9		**UPON REACHING 20 to 25 HOURS FOLLOWING INSTALLATION OF A FORWARD, AFT, OR COMBINING TRANSMISSION OR AN AFT ROTARY-WING DRIVE SHAFT, AND/OR UPON REACHING 20 TO 25 HOURS OF OPERATING TIME ON A NEW, OVERHAULED, OR REWORKED AIRCRAFT** Retorque (back off and retighten) mount nuts to specified torque on the forward, aft, and combining transmissions and the aft rotary-wing drive shaft (chapter 6).		
5 & 6		**WHENEVER ROTOR SPEED EXCEEDS 265 RPM (METAL BLADES) OR 259 RPM (FIBERGLASS BLADES)** a. Replace the forward and aft rotary-wing heads (including vertical hinge pins) within 10 flight hours after overspeeding (for recovery or evacuation flights only). Identify heads as overspeeding. b. Inspect the trailing edge of the rotary-wing blades for buckling or waviness (metal blades) (chapter 5).		
5 & 6		**WHENEVER A ROTARY-WING BLADE HAS MADE CONTACT WITH A FOREIGN OBJECT OR POWER TRAIN HAS BEEN SUBJECTED TO A SUDDEN REDUCTION IN RPM** a. If ground maneuver results in blade(s) striking the ground, remove all blades of forward and aft rotor. Return them for inspection. Identify blades as ground strike. b. If blade(s) strikes tunnel or fuselage, remove all three blades from that rotor. Return them for inspection. Identify blades as fuselage strike. c. If blade strike results in breaking off one or more blade sections, remove all blades from that rotor. Return undamaged blades for inspection. Identify blades as ground or fuselage strike. d. If blade damage or a sudden rpm reduction in the power train occurs, inspect the following:		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		b. Replace the combining transmission if 150% torque is exceeded on either engine. c. Inspect any engine if 154% torque is exceeded on that engine. (Refer to TM 55-2840-254-23.) d. Replace the forward and aft transmissions if 200% total torque from both engines is exceeded.		
3,4,5 6 & 9	WHENEVER TRANSIENT (NEVER EXCEED) TORQUE LIMITS HAVE BEEN EXCEEDED. (CH-47C WITH T55-L-712 ENGINES ONLY)	a. Replace any engine transmission if 150% torque is exceeded on that transmission. b. Replace the combining transmission if 150% torque is exceeded on either engine. c. Inspect any engine if 116% torque is exceeded on that engine. (Refer to TM 55-2840-254-23.) d. Replace the forward and aft transmissions if 200% total torque from both engines is exceeded.		
5	INSPECTION PHASE NEAREST 300 HOURS OF AIRCRAFT OPERATION SINCE INITIAL OR SUBSEQUENT AFT PYLON INSTALLATION	Retorque (backoff and retighten) bolts NAS628 and nuts in the aft pylon to airframe splice to specified torque. (Refer to para 2-490.)		

AIRCRAFT INSPECTION CHECKSHEET	SPECIAL INSPECTION	PAGE NO. 19	NO. OF PAGES 42
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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		WHENEVER AN ENGINE TRANSMISSION OIL TEMPERATURE EXCEEDS 130°C FOR MORE THAN 1 HOUR OR EXCEEDS 140°C (NEVER EXCEED) a. Functionally check the affected oil temperature indicating system. (Refer to para 8-188.) b. If the indicating system is satisfactory, replace the engine transmission. (Refer to para 6-120 and 6-131.) c. Determine the cause of overheating. (Refer to para 6-309.)		
5		WHEN AN ENGINE TRANSMISSION IS REMOVED a. Check the quill shaft for condition. (Refer to para 6-121.) b. Check the engine output shaft seal and seal housing for oil leaks. (Refer to TM 55-2840-234-24/1, -24/2, or TM 55-2840-254-23.) c. Check engine power output shaft splines for condition. (Refer to TM 55-2840-234-24/1, -24/2, or TM 55-2840-254-23.) d. Clean and lubricate output shaft and mating drive shaft adapter splines.		
5		WHENEVER AN ENGINE OR ENGINE TRANSMISSION IS REMOVED Inspect the quill shaft nylon snubber. If snubber is cracked, distorted or disconnected from the shaft shoulder, replace with new like item. If snubber is disintegrated, replace the engine transmission. See para 6-121.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		(1) Aft rotor shaft aluminum (center) section and all power train drive shafting for buckling. If buckling is detected, remove all power train transmissions and drive shafting.		
		(2) If there is no buckling, proceed to step (4).		
		(3) If buckling if found and the power train components have been removed, proceed to step (6).		
		(4) Power train shafting, adapters, and plate assemblies for cracks and security of attachment.		
		(5) Bearing housing shock mounts for freedom of fore-and-aft movement on support trunnions, broken springs, and security.		
		(6) Support brackets for distortion, cracks, and security. Adjacent structure for damage.		
		(7) Blade spar roots for distortion. Blade surfaces for dents, buckles, wrinkles, and tears. Blade trailing edges for cracks and distortion.		
		(8) Shock absorbers for leakage, cracks (give particular attention to thread area of rod end), distortion, and unrestricted travel. Attachment brackets for cracks and elongated holes.		
		(9) Rotary-wing head, pitch links, and controls for cracks, nicks, and distortion.		
		(10) Upper dual-boost actuators for leakage. Attachment fittings for cracks and security.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5	**AT 600 HOURS TOTAL OPERATING TIME ON AFT ROTARY-WING BLADES (114R1502-10, -14, -16, -18, -24, -26 ONLY) AND EVERY 25 HOURS THEREAFTER**	Fluorescent penetrant inspect blade socket incidence bolt hole (bolt removed) area for cracks (chapter 5).		
6	**AT 600 HOURS TOTAL OPERATING TIME ON FORWARD ROTARY-WING BLADES (114R1502-9, -13, -15, -17, -23, -25 ONLY) AND EVERY 50 HOURS THEREAFTER**	Fluorescent penetrant inspect blade socket incidence bolt hole (bolt removed) areas for cracks (chapter 5.)		
5 & 6	**WHEN A ROTARY-WING BLADE SERVICEABILITY INSPECTION HAS BEEN CONDUCTED OR WHEN A ROTARY-WING BLADE HAS BEEN REPLACED WITH A NEW OR NEWLY OVERHAULED BLADE, AFTER THE FIRST FLIGHT (METAL BLADES ONLY.)**	Retorque socket clamp bolts to specified torque. Back off and retighten to specified torque (chapter 5).		
5 & 6	**WHEN A ROTARY-WING HEAD IS REPLACED OR REINSTALLED, AFTER THE FIRST FLIGHT**	Check retaining nut for specified torque (chapter 5).		
5 & 6	**WHEN A ROTARY WING BLADE IS REPLACED, PRIOR TO INSTALLATION OF A NEW BLADE (FRB ONLY)**	Inspect identification plate to insure the letters "E" or "F" is stamped on the plate. If "E" or "F" does not appear on the plate, the FRB is unserviceable.		
5	**WHENEVER AN AFT LONGITUDINAL CYCLIC TRIM SYSTEM OR ACTUATOR FAILS IN THE EXTENDED POSITION IN FLIGHT (METAL BLADES INSTALLED)**	Inspect the trailing edge of the aft rotary-wing blades for buckling or waviness.		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5,6,8	WHEN A	TRANSMISSION, AFT ROTARY-WING DRIVE SHAFT, OR TRANSMISSION OIL COOLER IS REPLACED OR IS INACTIVE FOR 30 DAYS AFTER 30-MINUTE GROUND RUN AT NORMAL ROTOR RPM AND PRIOR TO FIRST FLIGHT Remove and inspect the applicable filter(s) for contamination.		
5,6,8	WHEN A	TRANSMISSION, AFT ROTARY-WING DRIVE SHAFT, OR TRANSMISSION OIL COOLER IS REPLACED OR IS INACTIVE FOR 30 DAYS, AFTER THE FIRST FLIGHT Visually inspect the applicable filter(s) for extended indicator buttons (if installed) or filter(s) for contamination.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 18	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		**WHENEVER THE AIRSPEED LIMITATION, LONGITUDINAL CYCLIC TRIM ACTUATORS RETRACTED, AS SPECIFIED IN TM 55-1520-227-10-2, CHAPTER 5, FIGURE 5-10, HAS BEEN EXCEEDED (FOR CH-47B AND CH-47C WITH 114D3250 SERIES AFT ROTOR SHAFT INSTALLED)** NOTE If VNE is exceeded during other than transitional flight and cruise guide system is operating normally, an engineering assessment is required. a. Forward actuator retracted - Inspect forward rotor head and droop stops for damage. b. Aft actuator retracted - Replace the aft rotary-wing drive shaft (chapter 6).		
5		**WHENEVER THE AIRSPEED LIMITATION, LONGITUDINAL CYCLE TRIM ACTUATORS RETRACTED, AS SPECIFIED IN TM 55-1520-227-10, CHAPTER 7, FIGURE 7-7, HAS BEEN EXCEEDED (FOR CH-47B WITH 114D3002 SERIES AFT ROTOR SHAFT INSTALLED)** NOTE If VNE is exceeded during other than transitional flight and cruise guide system is operating normally, an engineering assessment is required. a. Forward actuator retracted - Inspect forward head and droop stops for damage. b. Aft actuator retracted - Replace the aft rotary-wing drive shaft (chapter 6).		
5,6,8, 9 & 10		**WHENEVER THE FLIGHT CONTROLS HAVE BEEN MOVED OR HYDRAULIC PRESSURE REMOVED WHILE RIGGING PINS ARE INSTALLED** Inspect for damage (chapter 11).		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 19	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5 & 6	**WHENEVER ROTOR BLADES ARE POUNDED AGAINST THE DROOP STOPS OR HAVE EXPERIENCED VIOLENT AND HEAVY FLAPPING OR HAVE BEEN EXPOSED TO HURRICANE OR TORNADIC WINDS**			
		a. Metal blades without ISIS - Damage to droop stops, pitch links, hub, or blade spars requires replacement of all three rotor blades installed on that rotor. Return blades for inspection. Identify the removed blades as having experienced excessive flapping.		
		b. Metal blades with ISIS and fiberglass blades - Damage to droop stops, pitch links, hub, or blade spars requires replacement of only the affected blades. Return blades for inspection. Identify the removed blades as having experienced excessive flapping.		
5,6,8, 9 & 10	**WHEN A COMPONENT PART OF THE FLIGHT CONTROLS OR ROTOR CONTROLS HAS BEEN REPLACED OR REINSTALLED**			
		a. Perform a controls system interference check (Power ON) (chapter 11).		
		b. Check flight controls for free (unrestricted) movement in response to cockpit controls (Power ON).		
		c. Perform the applicable portions of a neutral rig check (chapter 11).		
5,8, & 9	**WHEN ANY SECTION OF THE SYNCHRONIZING DRIVE SHAFTING OR ADAPTER IS DISASSEMBLED AND REINSTALLED, OR REPLACED**			
		a. Phase the rotary-wing system (chapter 6).		
		b. Check drive shafting for proper indexing. Bearing shock mounts for proper positioning and freedom of forward and aft movement on support trunnions (chapter 6).		
		c. Clean and lubricate drive shaft adapter splines and mating transmission input/output shaft splines.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 20	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
6		**INSPECTION PHASE NEAREST 2,400 HOURS OF SYNCHRONIZING DRIVE SHAFT (114D3046 SERIES ONLY) OPERATION** Remove No. 7 shaft and perform a serviceability inspection (chapter 6).		
5,6,8, 9 & 10		**WHENEVER ARMOR PLATE HAS BEEN HIT BY A PROJECTILE** Remove armor plate and other panels or components in the immediate area for access. Inspect the following: a. Armor plate, brackets, isolators, mounting structure, and hardware for damage and cracks. b. Fluorescent penetrant inspect areas where cracks are suspected.		
9		**WHEN AN INTERNAL FAILURE (METAL CONTAMINATION) OF A FLIGHT CONTROL OR UTILITY HYDRAULIC PUMP OR MOTOR OCCURS** Flush the affected system for a minimum of 1 hour. Use a hydraulic test stand equipped with a 3-micron filter (chapter 7).		
5		**PRIOR TO INSTALLATION OR REPLACEMENT OF AFT TRANSMISSION** Visually inspect the upper housing adjacent to the aft mount lugs for cracks, using light and 6 power magnification.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 21	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
	EVERY 12 1/2 HOURS			
5 & 6		**Take forward and aft transmission oil samples.**		
	EVERY 25 HOURS			
8		a. Utility hydraulic accumulators (system pressure depleted) for specified air pressure (chapter 1).		
3 & 4		b. Perform a resistance check on No. 1 and No. 2 engine bearing chip detector (T55-L-11 and -712 only).		
3 & 4		c. Variable inlet guide vane actuators on No. 1 and No. 2 engines for leakage, damage and security (T55-L-11ASA only).		
5 & 6		**d. Remove, inspect and clean forward and aft transmission oil filters. Inspect aft transmission filter for open bypass valve.**		
		e. Remove and inspect the No. 1 and No. 2 engine transmission chip detectors, debris indicating screens, and oil filters for contamination. Check the chip detectors for magnetism and continuity. (Applies only to aircraft not equipped with transmission breather vent lines and steel control rods P/N 114CS2520-1 and -2.		
5 & 6		f. Metal Blades Only. (Foward transmission 114D1200-12, -14, -19, and -501). Visually inspect the axial position of the bushings in the lugs of the forward transmission pivoting and swiveling actuator connection (chapter 7).		
5&6		g. Visually inspect the forward and aft rotor head spacers P/N 114R3127 series for cracks.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 22	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5&6	WHEN A ROTOR HEAD IS REMOVED	Also, remove the spacer and drive collar. Visually inspect the spacer for cracks. Perform fluorescent penetrant inspection for cracks in the splines and upper surface of the drive collar.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 23	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5	**EVERY 50 HOURS**			
		a. Aft slider shaft lower mounting flange for cracks (visual). Particular attention to the radius between the flange and shaft and around the mounting nuts (CH-47C only).		
		b. No. 1 and No. 2 engine accessory gear box chip detector for contamination. Remove, inspect, clean, and check for continuity. There should be no continuity through chip detectors.		
		c. No. 1 and No. 2 engine transmission chip detectors for contamination. Remove, inspect, clean and check for continuity. There should be no continuity through chip detectors.		
		d. Aft verticle shaft chip detector for contamination. Remove, inspect, clean, and check for continuity. There should be no continuity through chip detectors.		
		e. Fwd combining and aft transmission chip detectors for contamination. Remove, inspect, clean, and check detectors for continuity. There should be no continuity through the chip detectors.		
		f. Fuel shut off and crossfeed gate valves and indicator lights for proper operation.		
		g. Fwd and aft rotor droop stops for distortion, wear, and security. Attaching lugs and hardware for wear.		
		h. Deleted.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 24	NO OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		EVERY 100 HOURS		
3 & 4		a. No. 1 and No. 2 engine barrier fuel filters for contamination. Install new filter element (T55-L-7 series engines only).		
3 & 4		b. No. 1 and No. 2 engine static fuel filter for contamination. Install new filter element (T55-L-11 series engines only).		
3 & 4		c. No. 1 and No. 2 engine in-line fuel filters for contamination. Remove, inspect and clean filter element (T55-L-11 series engine only).		
3 & 4		d. No. 1 and No. 2 engine fuel control and pump filters for contamination. Remove, inspect and clean filter.		
3 & 4		e. Engine main fuel manifold filters (2) for contamination (T55-L-7/7B only). Remove, inspect and clean filters.		
3 & 4		f. No. 1 and No. 2 engine oil filter for contamination. Remove, inspect, and clean (T 55-L-7C and T 55-L-11 engines only).		
5 & 6		g. Fwd, aft, and combining transmission mounting structure and adjacent structural area for cracks, loose or missing rivets.		
5 & 6		h. Aft vertical shaft, mounting structure and adjacent structural area for cracks, loose or missing rivets.		
6		i Forward transmission (114D1001-18 thru -23, CH-47B only) input shaft for axial play (TM 55-1520-227-23-2).		
5 & 6		j. Fwd and aft rotor hub for crack radiating from the 1.4 inch diameter holes in the vertical shear webs inboard of the trailing horizontal hinge pin lugs. (Does not apply to aft rotor head assembly 114R2004-4 and fwd rotor head assembly 114R2003-3).		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 25	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		k. Combining transmission (114D5001-13 thru -17, CH-47B only) input gear shafts for axial play (2 places No. 1 and No. 2 engine). (Refer to TM 55-1520-227-23-2.)		
5 & 6		l. Rotary wing blade nose caps for chord wise cracks (metal blades).		
5 & 6		m. Fiberglass rotor blades damper attachment bracket for cracks.		
3 & 4		n. Engine transmission input pinion gear, (114D6044) for internal wear (CH-47B only). Does not apply to 1146001 -20 and -21 transmission assemblies (chapter 6).		
3 & 4		o. No. 1 and No. 2 engine transmission and combining transmission oil filter for contamination. Remove, inspect, and clean filter.		
5		p. Aft vertical shaft filter for contamination. Remove, inspect, and clean filter .		
8		q. External cargo hook for emergency (air pressure) and manual release operation. Reservice cargo hook to specified air pressure (2100 PSI). Visually inspect rollers and cams for freedom of operation, wear, distortion, and corrosion; check cable for condition and rigging.		
3 & 4		r. Inspect T55-L-11ASA engine variable inlet guide vanes for excessive wear of the vane attachment points.		
5		s. Aft transmission upper housing adjacent to aft mount lugs. Visually inspect for cracks using light and 6 power magnification.		
5 & 6		t. Check forward and aft fixed droop stop bolt torque (65 to 75 LB-IN).		
10		u. Inspect OAT/FAT gage in accordance with TM 55-1500-204-25/1.		
5 & 6		v. FRB only. Inspect forward and aft pitch link bolts for specific torque (chapter 5).		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		WHENEVER THE AIRSPEED LIMITATION, LONGITUDINAL CYCLIC TRIM ACTUATORS RETRACTED, AS SPECIFIED IN TM 55-1520-227-10, CHAPTER 7, FIGURE 7-7 HAS BEEN EXCEEDED (FOR CH-47B WITH 114D3002 SERIES AFT ROTOR SHAFT INSTALLED) a. Forward actuator retracted - Inspect forward head and droop stops for damage. b. Aft actuator retracted - Replace the aft rotary-wing drive shaft. (Refer to paras 6-70 and 6-75.)		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		w. Aft Landing Gear Lower Drag Links, P/N 114L2323, for cracks on the outer surface, paying particular attention to the area around the forward trunnion anti-rotation bolt hole (chapter 3).		
		x. Main structural formers and longerons throughout the ramp area for distortion, cracks, damage, corrosion, loose or missing fasteners. In the formers at STA 482, 534, and 594, look particularly for cracks in the upper caps from the aft transmission mount deck down to and including the splice with the side cap, the splice angles at STA 594, and the forward engine mount and adjacent structure.		
		y. Inspect forward and aft transmission bevel gear joint nuts for proper torque (paragraphs 6-49, 6-101). Transmissions that last overhaul date was between May 82 and Jan 85, or that cannot be determined.		
2&7	EVERY 30 DAYS	If corrosion was found during the last inpection, inspect for corrosion the fuselage bilge area under the cabin floor.		
2	EVERY 30 DAYS OR 25 HOURS WHICHEVER OCCURS FIRST	Perform preventive maintenance on battery. (Refer to TM 11-6140-203-14-2.)		
2&7	EVERY 90 DAYS OR 180 DAYS DEPENDING UPON RESULTS OF PREVIOUS CORROSION INSPECTION	If no corrosion was found during the 30 day interval inspection, perform the next corrosion inspection in the fuselage bilge area under cabin floor at a 90 day interval. If no corrosion is found at the 90 day inspection, all subsequent inspections can be performed at 180 day intervals unless corrosion is found. If corrosion is found, reinspect after 90 days.		
2	EVERY 120 DAYS OR EVERY 100 HOURS WHICHEVER OCCURS FIRST	Remove battery for inspection and serviceability check. (Refer to TM 11-6140-203-14-2.)		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
3 & 4		EVERY 200 HOURS **Retorque Engine Drive Shaft nuts and bolts (Chapter 6, para 6-35.1)**		
3&4		**AFTER 200 HOURS OF ENGINE OPERATION AND EVERY 50 HOURS THEREAFTER.** Inspect Aft Engine Connecting Link (para 4-80g.)		
5		**AFTER 300 HOURS OF AIRCRAFT OPERATIONS SINCE INITIAL OR SUBSEQUENT AFT PYLON INSTALLATION** Retorque (backoff and retighten) bolt NAS 628 and nuts in the aft pylon to airframe splice to specified torque (chapter 2).		
5&6		**AFTER 300 HOURS OF AIRCRAFT OPERATIONS SINCE INITIAL OR SUBSEQUENT FORWARD AND AFT TRANSMISSION BEVEL GEAR JOINT NUTS FOR PROPER TORQUE INSPECTION.** Inspect forward and aft transmission bevel gear joint nuts for proper torque (para 6-49, 6-101). All forward and aft transmissions NOT overhauled between May 1982 and January 1985.		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		**INSPECT AFTER 900 HOURS OF FORWARD ROTARY-WING BLADE OPERATION OR EVERY 36 MONTH PERIOD SINCE NEW OR LAST INSPECTION WHICHEVER OCCURS FIRST (114R1502-9, -13, -15, -17, -23, -25, -27, -29, -31, -33, -49 ONLY)** Borescope inspect internal surfaces of blade spar for corrosion (chapter 5).		

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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5		**INSPECT AFTER 600 HOURS OF AFT ROTARY-WING BLADE OPERATION OR EVERY 36 MONTH PERIOD SINCE NEW OR LAST INSPECTION WHICHEVER OCCURS FIRST (114R1502-10, -14, -16, -18, -24, -26, -28, -30, -32, -34, -50 ONLY)** Borescope inspect internal surfaces of blade spar for corrosion (chapter 5).		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
8, 9, & 19		c. Flooring tiedown fittings for corrosion and security.		
		d. Heater ducts beneath flooring for cracks and security.		
		e. Cargo door actuating mechanism components for wear and security.		
		f. Pilots and copilots door latch and jettison mechanism for damage and corrosion. Seal for deterioration, cracks and distortion. Reinstall door and check for security in locked position and binding.		
		g. Cargo ramp jettisonable door for positive release. Door and enclosure for damage and corrosion. Seals for deterioration, cracks, and distortion. Release mechanism for wear and corrosion. (Upon installation, check locking mechanisms for secure engagement.)		
		h. Heater drain for obstructions.		
8 & 10	EVERY	12 MONTHS		
		Turn in first aid kits for inspection. (Refer to TM 55-1500-328-25.)		
8, 9 & 10	EVERY	6 MONTHS		
		a. Inspect portable fire extinguishers for weight. (Refer to TM 55-1500-204-25/1.)		
		b. Clean aircraft.		
		c. Navigation and anticollision lights for moisture and security.		
		d. Forward Landing Gear Wheels for cracks, corrosion, deterioration of finish.		
		e. Aft Landing Gear Wheels for cracks, corrosion, and deterioration of finish.		
		f. Navigation Lights for moisture and security.		
		g. Anticollision Lights for moisture and security.		
		h. Formation Lights for moisture and security.		
		i. Fuselage bilges for liquids. (Open drain valves on underside of fuselage. Close valves after draining.)		

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AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
9		WHEN AN INTERNAL FAILURE (METAL CONTAMINATION) OF A FLIGHT CONTROL OR UTILITY HYDRAULIC PUMP OR MOTOR OCCURS Flush the affected system for a minimum of 1 hour. Use a hydraulic teststand equipped with a 3-micron filter. (Refer to para 7-16 and 7-219.)		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 30	NO. OF PAGES 38
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AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5 & 6		**INSPECT AFTER 600 HOURS OF FORWARD AND AFT ROTARY-WING HEAD OPERATION SINCE NEW OR OVERHAUL** Replace horizontal hinge pins and bearings with new serviceable items. Inspect vertical hinge pin bearings for spalling and damage. Rotate serviceable vertical hinge pin bearings 180° and reinstall them (chapter 5). Applies to rotor head assemblies 114R2003-1 and 114R2004-2 only.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 31	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		INSPECTION PHASE NEAREST 600 HOURS Replace No. 1 and No. 2 engine transmission quill shaft nylon snubbers.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 32	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
5 & 6		**INSPECT AFTER 300 AND 900 HOURS OF FORWARD AND AFT ROTARY-WING HEAD OPERATION SINCE NEW OR OVERHAUL** Inspect horizontal hinge pins and bearings for spalling and damage (chapter 5). Rotate serviceable horizontal hinge pins and bearings 180° and reinstall them (chapter 5). Applies to rotor head assemblies 114R2003-1 and 114R2004-2 only.		
5 & 6		INSPECT AFTER 400 HOURS OF OPERATION WITH FIBERGLASS ROTOR BLADES AND AT EVERY 400 HOURS FLIGHT INTERVAL THEREAFTER Remove both end caps from the three horizontal pins on each head. Inspect the lower portion of the bearing for failed bearing. Ignore the extremely fine copper from the thrust washers which is normal. If bearing debris is found, disassemble and inspect the bearing and pin for spalling, damage and corrosion. (Chapter 5)		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 33	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
8,9, & 10	**EVERY 6 MONTHS**			
3, 4 & 9		Inspect engine fire extinguisher system as follows: (1) Container for security, nicks, dents, and deep scratches. Cartridge for serviceability (table 1-16 and DA Form 2408-18). (2) Purge all valves, tees, and tubing (chapter 12). (3) System tubing and electrical connections for condition and security (chapter 12). (4) Inspect portable fire extinguisher for weight. (Refer to TM 55-1500-204-25/1.)		
10	**EVERY 12MONTHS OR NEAREST SCHEDULED INSPECTION**			
		Inspect and test OAT/FAT gage. (Refer to TM 55-1500-204-25/1.)		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 34	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		AT THE INSPECTION PHASE NEAREST EACH 12 TO 15 MONTH PERIOD (NOT TO EXCEED 15 MONTHS)		
ALL		a. Open up or remove all cockpit, cabin, ramp flooring, all tunnel covers, aft pylon, forward transmission, control areas and combines transmission areas and No. 1 and No. 2 engine cowlings. Remove sound proofing from cabin interior.		
ALL		b. Inspect the electrical systems for the following: (1) Electrical wiring (visible portions, with flooring and inspection access panels removed) for defects. (Refer to para F-6.) (2) Electrical wiring for chafing, proper support and security. (3) Electrical wiring heat-shrinkable tubing for deterioration. (4) Connectors for evidence of overheating, corrosion, and security. (5) Connectors for installation of cable clamp adapters except on those that are moisture proof. Connector coupling nuts for installation of lockwire or other mechanical locking means. (6) Bonding jumpers for breaks, corrosion and security. (7) Terminal connections for corrosion and security. Terminal boards for covers. (8) Overhead switch and circuit breaker panels (opened), wiring, and connections for chafing and security. Insulation for general condition. (Refer to para F-6.)		
ALL		c. Inspect the flight control linkage and surrounding mounting brackets and structure for the following:		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 35	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		(1) Flight control linkage for interference or binding.		
		(2) Flight control linkage for cracking or corrosion.		
		(3) Flight control mounting structure for cracks or corrosion.		
ALL		d. Inspect aircraft structure externally and internally for the following:		
		(1) Cockpit control linkage, cabin, and ramp structure under floor (flooring removed), floor panels, ramp hinge fittings (sta 482), and floor beams for cracks, corrosion, and deterioration of finish.		
		(2) Flooring vibration isolators for deterioration and condition.		
		(3) Flooring tiedown fittings for corrosion and security.		
		(4) Heater ducts beneath flooring for cracks and security.		
		(5) Cargo door actuating mechanism components for wear and security.		
		(6) Pilots and copilots door latch and jettison mechanism for damage and corrosion.		
		(7) Cargo ramp jettisonable door and enclosure for damage and corrosion. Seals for deterioration, cracks, and distortion. Release mechanism for wear and corrosion.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 36	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
		(8) Ramp extension, motor, chain, and cable for condition.		
		(9) Heater drain for obstructions.		
		(10) Deleted.		
		(11) Forward transmission and control area for condition and corrosion.		
		(12) Combining transmission area for condition, cracks, and corrosion.		
		(13) Deleted.		
		(14) No. 1 and No. 2 engine access areas for condition and corrosion.		
		(15) APU area for condition and corrosion.		
		a. Check APU turbine drain fitting for cleanliness.		
		b. Replace APU oil filter.		
		(16) Lower pod hinge area (externally) for condition and corrosion.		
		(17) Landing gear support structure for condition and corrosion.		
		(18) Formers, webs, and attaching intercostals for cracks at sta 320 and 360 between left BL 40 and right BL 40. All cracks must be repaired (chapter 2).		
		(19) All aircraft exterior for corrosion, cracks, or missing bolts, screws, and rivets.		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 37	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
8 & 10		e. Check magnetic standby compass indicator for correct reading on all cardinal headings. (Refer to TM 55-1500-204-25/1.)		
10		f. Check remote magnetic compass indicator for correct reading on all cardinal headings. (Refer to TM 55-1500-204-25/1).		
		g. Perform an inspection of the pitot-static system (chapter 8).		
		h. Perform an inventory check. Refer to DA Form 2408-17 and Appendix C.		
		i. Turn in first aid kits for inspection. (Refer to TM 55-1500-204-25/1.)		

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 38	NO. OF PAGES 38
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
10		**EVERY 24 MONTHS (NOT TO EXCEED 30 MONTHS)**		
		a. Inspect and test altimeters. (Compute calendar time from date stamped on instrument case.) (Chapter 8.)		
		b. Test accuracy of airspeed indicators. (Compute calendar time from date stamped on instrument case (chapter 8.)		
		c. (MRB Only) Inspect vertical hinge pins and rotary wing blade socket. Vertical pin bores for rust and fretting corrosion (blades removed) (chapter 5).		
8&10		d. Deleted.		

SECTION V OVERHAUL AND RETIREMENT SCHEDULE

1-117. Introduction.

a. This section lists units of operating equipment that are to be overhauled or retired at the period specified. Removal of equipment for overhaul may be accomplished at the inspection nearest the time when overhaul is due unless otherwise specified in TM 55-1500-328-25. (Table 1-14, 1-14.1 and 1-14.2).

b. This section also lists installation restrictions of component configurations versus aircraft models.

c. Overhaul intervals are listed for the CH-47B and for the CH-47C aircraft with T55-L-7 and with T55-L-11 series or T55-L-712 engines installed. Transmissions and aft rotary-wing drive shafts identified by the letter *B* following the part number on the component nameplate are limited to the overhaul intervals indicated for the CH-47B. Transmissions identified by *L-11* on the component nameplate are limited to the overhaul intervals indicated for the CH-47C (L-11 series) aircraft. Aft rotary-wing shafts used on CH-47C aircraft with fiberglass rotor blades have their retirement time reduced to 2600 hours. These shafts are striped and stenciled with a 2600-hour-life designation.

d. Exceptions to overhaul intervals are contained in para 1-119.

e. Whenever a bolt with an assigned retirement interval is replaced (not reinstalled) it shall be immediately mutilated and locally scrapped. The replacement bolt shall be a new (zero time) item.

1-118. Definitions.

a. Overhaul interval. The maximum authorized operating time or calendar interval of parts prior to removal for overhaul at category of maintenance authorized in accordance with the maintenance allocation chart.

b. Retirement schedule. The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.

Items replaced on a calendar basis (for the purpose of overhaul or retirement) will not be listed on DA Form 2408-16, Component Installation and Removal Record, but will be listed on DA Form 2408-18, Equipment Inspection List, for scheduling purposes.

1-119. Exceptions to Overhaul Intervals.

Several CH-47 major components are in service which require removal prior to reaching assigned Overhaul Intervals. These components shall be removed from service and returned for overhaul at or prior to the removal time (Usage Since New) indicated in table 1-15.

NOTE

> To preclude possible error in scheduling the removal of the following items, the applicable aircraft DA Form 2408-16 will be annotated as follows:

a. Place an asterisk (*) in columns 7j and k (adjacent to hours entry) on the line for the serial numbered items of table 1-15 only.

b. Adjust entry in column 7k (aircraft hours) to schedule the removal of the component at/or immediately prior to the published expiration of "Removal Time" assignment on the below listed serial numbered items.

c. Enter the following in Block B: "**(date of entry), (Component), (serial number)* is assigned limited usage in accordance with TM 55-1520-227-23-1. Replacement. Due entry adjusted accordingly *(unit making entry)*."

1-120. Removal of Selected Rotor Blades.

The rotor blades listed in table 1-17 shall be removed from service at the specified removal time and returned for storage and future modification. (Does not apply to blades with ISIS installed.)

1-121. Special Inspection Intervals for Selected Rotor Blades (Metal Blades Only).

NOTE

> Special Inspection Intervals do not apply to fiberglass rotor blades 114R1702 series.

a. Rotor blade assemblies 114R1502-9 thru -44, are subject to fairing core corrosion at the trailing edge of the main spar. Since this condition reduces the service life of the rotor blades, they must be removed from service at a specified calendar time or operating hours for inspection.

b. Effective 1 January 1979, all rotor blades P/N 114R1502-9 thru -44 shall have been inspected or rebuilt to a like-new corrosion free condition. If any of these rotor blade part numbers have not been inspected or rebuilt, they shall be immediately removed from service.

c. Blades which have been inspected are marked "CI XXXX/XXXX HRS" and blades which have been rebuilt are marked "LN XXXX/XXXX HRS" on the identification plate. The first four digits depict the Julian Date and the second set of digits depict the total operating hours when the blade was processed. The DA Form 2408-16 (Blade Assembly) should show when and at what flying hour time the blade was processed. In the event that the DA Form 2408-16 is not available, or a MAX LIMIT calendar date is not shown thereon, the next corrosion inspection can be determined as follows:

(1) Forward blades marked LN — the next inspection is due 6 years or 900 hours, whichever occurs first, from the corrosion inspection date/time shown on the nameplate.

(2) Aft blades marked LN — the next inspection is due 6 years or 400 hours, whichever occurs first, from the corrosion inspection date/time shown on the nameplate.

(3) Blades marked C1 — the next inspection is due three years or 900 hours for forward blades and 2 years or 400 hours for aft blades from the corrosion inspection date/time shown on the nameplate, whichever occurs first.

1-122. Removal of Selected Rotor Head Assemblies. Several CH-47B/C rotor head assemblies are in service which require removal prior to reaching their assigned overhaul interval. The rotor head assemblies listed in table 1-19 shall be removed from service at/or prior to 400 hours since last overhaul (TSO) and returned to the overhaul depot for a one-time inspection.

1-123. Replacement of Rotor Controls Bolts Every 4,000 Aircraft Hours. Several bolts in the upper rotor controls are assigned a 4,000 hour retirement interval. Upon reaching 4,000 hours aircraft time and every 4,000 aircraft hours thereafter, the bolts listed in table 1-20 shall be replaced with new life items.

Table 1-14. Overhaul and Retirement Schedule

		OVERHAUL INTERVAL				
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
Forward Rotary-Wing Drive Transmission						
	114D1001-28	1200(2)	(1)	(1)	(1)	
	114D1001-29	1200(2)	(1)	(1)	(1)	
	114D1001-30	1200(2)	(1)	(1)	(1)	
	114D1001-31	1200(2)	(1)	(1)	(1)	
	114D1001-32	1200	(1)	(1)	(1)	
	114D1200-5	1200(2)	1200(2)	1200(2)	(1)	
	114D1200-6	1200(2)	1200(2)	1200(2)	(1)	
	114D1200-7	1200(2)	1200(2)	1200(2)	(1)	
	114D1200-9	1200(2)	1200(2)	1200(2)	(1)	
	114D1200-11	1200	1200	1200	(1)	
	114D1200-12	1200	1200	1200	(1)	
	114D1200-13	(1)	(1)	(1)	1200	

Table 1-14. Overhaul and Retirement Schedule (Con't)

		OVERHAUL INTERVAL				
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
	114D1200-14	1200	1200	1200	(1)	
	114D1200-15	(1)	(1)	(1)	1200	
	114D1200-17	(1)	(1)	(1)	1200	
	114D1200-19	1200	1200	1200	(1)	
	114D1200-501	1200	1200	1200	(1)	
	114D1200-502	(1)	(1)	(1)	1200	
Aft Rotary-Wing Drive Transmission	114D2001-28	1200(2)	(1)	(1)	(1)	
	114D2001-29	1200(2)	(1)	(1)	(1)	
	114D2001-30	1200(2)	(1)	(1)	(1)	
	114D2001-31	1200(2)	(1)	(1)	(1)	
	114D2001-32	1200	(1)	(1)	(1)	
	114D2200-7	1200(2)	1200(2)	1200(2)	1200(2)	
	114D2200-8	1200(2)	1200(2)	1200(2)	1200(2)	
	114D2200-9	1200(2)	1200(2)	1200(2)	1200(2)	
	114D2200-11	1200(2)	1200(2)	1200(2)	1200(2)	
	114D2200-13	1200	1200	1200	1200	
	114D2200-15	1200	1200	1200	1200	
	114D2200-17	1200	1200	1200	1200	
	114D2200-501	1200	1200	1200	1200	
Engine Combining Transmission	114D5001-13	700	(1)	(1)	(1)	
	114D5001-15	700	(1)	(1)	(1)	
	114D5001-16	700	(1)	(1)	(1)	
	114D5001-17	700	(1)	(1)	(1)	
	114D5001-18	700	(1)	(1)	(1)	
	114D5001-19	700	(1)	(1)	(1)	
	114D5001-20	700	(1)	(1)	(1)	
	114D5001-22	1200	(1)	(1)	(1)	
	114D5001-517	700	(1)	(1)	(1)	

Table 1-14. Overhaul and Retirement Schedule (Con't)

		OVERHAUL INTERVAL				
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
	114D5001-518	700	(1)	(1)	(1)	
	114D5001-519	700	(1)	(1)	(1)	
	114D5001-520	700	(1)	(1)	(1)	
	114D5001-521	1200	(1)	(1)	(1)	
	114D5001-21	1200	(1)	(1)	(1)	
	114D5200-1	(1)	(1)	(1)	(1)	
	114D5200-2	(1)	(1)	(1)	(1)	
	114D5200-8	(1)	1200	1200	1200	
	114D5200-12	(1)	1200	1200	1200	
Engine Mechanical Transmission	114D6001-16	1200	(1)	(1)	(1)	
	114D6001-17	1200	(1)	(1)	(1)	
	114D6001-18	1200	(1)	(1)	(1)	
	114D6001-19	1200	(1)	(1)	(1)	
	114D6001-20	1200	(1)	(1)	(1)	
	114D6001-21	1200	(1)	(1)	(1)	
	114D6200-1	(1)	900(6)	900(6)	900(6)	
	114D6200-2	(1)	900(6)	900(6)	900(6)	
	114D6200-3	(1)	900(6)	900(6)	900(6)	
	114D6200-4	(1)	1200	1200	1200	
	114D6200-6	(1)	1200	1200	1200	
Aft Rotary-Wing Drive Shaft	114D3002-7	1800	(1)	(1)	(1)	3600
	114D3002-8	1800	(1)	(1)	(1)	3600
	114D3250-1	1800	1800	1800	1300	2600 or 3600(7)
	114D3250-5	1800	1800	1800	1300	2600 or 3600(7)
Synchronizing Drive Shaft Assembly	114D3048-1	2400	2400	2400	2400	
	114D3048-5	2400	2400	2400	2400	
	114D3048-6	2400	2400	2400	2400	
	114D3048-7	2400	2400	2400	2400	
	114D3070-1	2400	2400	2400	2400	
	114D3070-3	2400	2400	2400	2400	
	114D3070-4	2400	2400	2400	2400	
	114D3070-5	2400	2400	2400	2400	
	114D3070-6	2400	2400	2400	2400	
	114D3072-1	2400	(1)	(1)	(1)	
	114D3241-1	2400	2400	2400	2400	
Synchronizing Drive Shaft Adapters	114D3065-1	2400	(1)	(1)	(1)	
	114D3243-1	2400	2400	2400	2400	
	114D3067-2	(1)	(1)	(1)	(1)	
	114D3067-3	2400	2400	2400	2400	
	114D3067-4	(1)	(1)	(1)	(1)	
	414D3212-5	2400	2400	2400	2400	
Engine Drive Shaft Assembly	114D3003-1	2400	(1)	(1)	(1)	
	114D3247-1	(1)	2400	2400	2400	

Table 1-14. Overhaul and Retirement Schedule (Con't)

		OVERHAUL INTERVAL				
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
Forward Rotary Wing Head	114R2003-1	1200	1200	1200	(1)	
	114R2003-2	1200	1200	1200	(1)	
	114R2003-3	1200	1200	1200	(1)	
	114R2003-4	1200	1200	1200	(1)	
	114R2003-5	1200	1200	1200	1200 (5)	
	114R2003-6	1200	1200	1200	(1)	
	114R2003-7	1200	1200	1200	1200 (5)	
	114R2003-8	1200	1200	1200	1200 (5)	
Aft Rotary-Wing Head	114R2004-2	1200	1200	1200	(1)	
	114R2004-3	1200	1200	1200	(1)	
	114R2004-4	1200	1200	1200	(1)	
	114R2004-5	1200	1200	1200	(1)	
	114R2004-6	1200	1200	1200	1200 (5)	
	114R2004-7	1200	1200	1200	(1)	
	114R2004-8	1200	1200	1200	1200 (5)	
	114R2004-9	1200	1200	1200	1200 (5)	
Forward Swashplate Assemblies	114R3505-1	800	800	800	(1)	
	114R3505-2	800	800	800	(1)	
	114R3505-3	1200	1200	1200	(1)	
	114R3505-4	1200	1200	1200	(1)	
	114R3505-7	1200	1200	1200	(1)	
	114R3505-8	1200	1200	1200	(1)	
	114R3505-15	800	800	800	(1)	
	114R3505-16	800	800	800	(1)	
	114R3505-17	1200	1200	1200	1200	
	114R3505-18	1200	1200	1200	1200	
	114R3505-21,-2 2	800	800	800	(1)	
Aft Swashplate Assembly	114R3505-1, -2	800(4)	(1)	(1)	(1)	
	114R3505-3, -4	1200(4)	(1)	(1)	(1)	
	114R3505-7, -8	1200(4)	(1)	(1)	(1)	
	114R3505-11, -12	(1)	1200	1200	(1)	
	114R3505-15, -16	800(4)	(1)	(1)	(1)	
	114R3505-17, -18	1200(4)	(1)	(1)	(1)	
	114R3505-19	(1)	1200	1200	1200	
	114R3505-20	(1)	1200	1200	1200	
	114R3505-21	800(4)	(1)	(1)	(1)	
	114R3505-22	800(4)	(1)	(1)	(1)	
	1615-CH47-001-2	1200(4)	(1)	(1)	(1)	
	1615-CH47-001-3	1200(4)	(1)	(1)	(1)	
Gas Turbine Engine						
T55-L-7	2-000-030-12	1800	(1)	(1)	(1)	
T55-L-7B	2-000-030-18	1800	(1)	(1)	(1)	
T55-L-7C	2-000-030-22	1800	1800	(1)	(1)	
T55-L-11ASA	2-001-020-09	(1)	(1)	1200	1200	
T55-L-11D	2-001-020-14	(1)	(1)	1200	1200	
T55-L-712	2-001-020-23	(1)	(1)	2400	2400	
Forward Rotary-Wing Blades	114R1502-9	3600	3600	(1)	(1)	
	114R1502-13	3600	3600	(1)	(1)	
	114R1502-15	3600	3600	(1)	(1)	
	114R1502-17	3600	3600	(1)	(1)	
	114R1502-23	3600	3600	(1)	(1)	

Table 1-14. Overhaul and Retirement Schedule (Con't)

COMPONENT	PART NO.	OVERHAUL INTERVAL CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
	114R1502-25				(1)	6000
	114R1502-27	3600	3600	(1)	(1)	
	114R1502-29	3600	3600	(1)	(1)	
	114R1502-31	3600	3600	(1)	(1)	
	114R1502-33				(1)	6000
	114R1502-43	o/c	o/c	o/c	(1)	
	114R1502-47	o/c	o/c	o/c	(1)	
	114R1502-49				(1)	6000
	114R1702-21	(1)	(1)	(1)	o/c	
	114R1702-37	(1)	(1)	(1)	o/c	
Aft Rotary-Wing Blades	114R1502-10	1500	1500	(1)	(1)	
	114R1502-14	1500	1500	(1)	(1)	
	114R1502-16	1500	1500	(1)	(1)	
	114R1502-18	1500	1500	(1)	(1)	
	114R1502-24	1500	1500	(1)	(1)	
	114R1502-26				(1)	4000
	114R1502-28	1500	1500	(1)	(1)	
	114R1502-30	1500	1500	(1)	(1)	
	114R1502-32	1500	1500	(1)	(1)	
	114R1502-34				(1)	4000
	114R1502-44	o/c	o/c	o/c	(1)	
	114R1502-48	o/c	o/c	o/c	(1)	
	114R1502-50				(1)	4000
	114R1702-22	(1)	(1)	(1)	o/c	
	114R1702-38	(1)	(1)	(1)	o/c	
Forward Pivoting Dual Actuating Cylinder	114H6600-3,-5	o/c	o/c	(1)	(1)	
	114H6600-19	(1)	(1)	o/c	(1)	
	114H6600-25	(1)	(1)	(1)	o/c	
Aft Pivoting Dual Actuating Cylinder	114H6600-4	o/c	o/c	(1)	(1)	
	114H6600-6	o/c	o/c	(1)	(1)	
	114H6600-18	o/c	o/c	(1)	(1)	
	114H6600-20	(1)	(1)			6600
	114H7200-1	(1)	(1)			6600
Forward Swiveling Dual Actuating Cylinder	114H6700-3	o/c	o/c	(1)	(1)	
	114H6700-13	(1)	(1)	o/c	(1)	
	114H6700-17	(1)	(1)	(1)	o/c	
Aft Swiveling Dual Actuating Cylinder	114H6700-4	o/c	o/c	(1)	(1)	
	114H6700-12	o/c	o/c	(1)	(1)	
	114H6700-14	(1)	(1)			7100

Table 1-14. Overhaul and Retirement Schedule (Cont'd)

		OVERHAUL INTERVAL				
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)	RETIREMENT INTERVAL
Fwd and Aft Upper Drive Arm Assembly	114SR3414-1		(1)	(1)	(1)	1200
	114R3434-4		(1)	(1)	(1)	1200
	114R3414-5		(1)	(1)	(1)	1200
	114R3434-5		o/c	o/c	o/c	
	114R3434-7		o/c	o/c	o/c	
Fwd and Aft Drive Collar Assembly	114R3388-5		(1)	(1)	(1)	700
Gas Producer Turbine Disassembly (T55-L-7C only)	2-120-030-22	1200	1200	(1)	(1)	

NOTES

(1) Shall not be installed in the helicopter model indicated.

(2) Overhaul interval if "ST" appears following the S/N on nameplate. Do not use these transmissions if "ST" does not appear following the S/N on the nameplate.

(3) Deleted.

(4) These swashplates will remain in place until they reach TBO. The replacement item shall be part number 1615-CH47-001-2 or -3 for aft only.

(5) When installing Rotor Head Assemblies on CH-47C with FRB, annotate the DA Form 2408-16 in block 8 as follows in order to ensure required identification:

a. ________________ FRBs were installed on this head.
Date

b. ________________ since new on rotor head at time of FRB installation.
Flight Hrs

(6) These transmissions shall be removed and replaced with part number 114D6200-4 or -6 not later than the next phase inspection cycle. Part numbers 114D6200-1, -2, -3 shall not be reinstalled.

(7) Retirement intervals for aft rotary wing drive shaft, part number 114D3250-1 is 3600 hours in CH-47B and CH-47C with Metal Rotor Blades (MRB) and 2600 hours in CH-47C with Fiberglass Rotor Blades (FRB). When installed in CH-47C with FRB these shafts shall be striped and stenciled with a 2600 hour life designation. Multiply existing MRB time since overhaul (TSO) and time since new (TSN) by 0.72 to obtain adjusted TSO and TSN.

o/c On condition removal.

Table 1-14.1 Retirement Schedule

		RETIREMENT INTERVAL			
COMPONENT	PART NO.	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)
Turbine, Rotor Assembly	2-140-000-23	1800	1800	N/A	N/A
	2-140-000-24	1800	1800	N/A	N/A
	2-140-000-27	1800	1800	N/A	N/A
	2-140-000-29	1800	1800	N/A	N/A
	2-140-000-30	1800	1800	N/A	N/A
	2-140-000-31	1800	1800	N/A	N/A
	2-140-000-33	1800	1800	N/A	N/A
	2-140-000-34	1800	1800	N/A	N/A
Support Fitting, Aft Pivoting Actuator	114S4111-35	N/A	9000	9000	9000
Bearing, Drive Shaft	114DS340-1	1200	1200	1200	1200
	145DS301-1	o/c	o/c	o/c	o/c
Fwd Pitch Change Link	114R3411-5*	o/c	o/c	o/c	2300
Aft Pitch Change Link	114R3411-6**	5000	5000	1000	1000
	114R3611-1	o/c	o/c	o/c	o/c
Bolt, Aft Swiveling Actuator to Swashplate	114R3650-3	300	300	N/A	N/A
Bolt, Aft Swiveling Actuator to Lower Attach	BACB30ST6-31	900	900	N/A	N/A
Bolt, Aft Pivoting Actuator to Swashplate	114R3650-3	300	300	N/A	N/A
Bolt, Aft Cyclic Trim Actuator to Swashplate	114R3650-6	600	600	N/A	N/A
Bolt, Aft Cyclic Trim Actuator to Yoke Assy	BACB30ST8-38	1000	1000	N/A	N/A
Bolt, Aft Fixed Link to Swashplate	114R3650-6	600	600	N/A	N/A
Bolt, Aft Fixed Link to Yoke Assembly	BACB30ST8-40	1000	1000	N/A	N/A
Rod End Bearing Assy, Aft Longitudinal Cyclic Trim Actuator	114CS118-1	1000	N/A	N/A	N/A
Rod End Bearing, Aft Longitudinal Cyclic Trim Actuator and Aft Fixed Link	114CS123-1	N/A	4000	4000	4000

*Fwd pitch links 114R3411-5 previously used on aircraft with MRBs are limited to a 2300 hour retirement interval from date of installation on CH-47C with FRBs. Fwd pitch links which have been previously used in CH-47C (T55-L-11 series or T55-L-712 engines) with FRBs are limited to a retirement interval of 2300 hours regardless of the aircraft in which they are installed. See Chapter 5 for identification instructions.

**Aft pitch links 114R3411-6 previously used on aircraft with MRBs are limited to a 1000 hour retirement interval from date of installation on CH-47C with FRBs. Aft pitch links which have been previously used in CH-47C (T55-L-11 series or T55-L-712 engines) with FRBs are limited to a retirement interval of 1000 hours regardless of the aircraft in which they are installed. See Chapter 5 for identification instructions.

o/c—On condition removal.

N/A—Not Applicable.

Table 1-14.2 Retirement Schedule

COMPONENT	PART NO.	RETIREMENT INTERVAL	
		CH-47B	CH-47C
Bearing, Horizontal Pin	114RS211-1	300*	300*
Bearing, Horizontal Pin	114RS211-2	300*	300*
Bearing, Horizontal Pin	114RS213-3	**	**
Bearing, Horizontal Pin	114RS213-4	**	**
Bearing, Vertical Pin	114RS210-1	600*	600*
Bearing, Vertical Pin	114RS210-2	600*	600*
Bearing, Vertical Pin	114RS214-5	**	**
Bearing, Vertical Pin	114RS214-6	**	**
Pin, Horizontal Hinge	114R2196-1	300*	300*
Pin, Horizontal Hinge	114R2196-2	**	**
Pin, Horizontal Hinge	114R2197-1	**	**

*Retirement interval may be extended 100% providing that the rotor head bearing and pins are rotated 180° at the hour level shown

****Horizontal hinge pins have been replaced or rotated at time of overhaul, therefore the rotor head assemblies can be operated for a full overhaul interval of 1200 hours without rotation of the bearings and pins.**

Table 1-15. Exceptions to Overhaul Interval Schedule

COMPONENT	SERIAL NUMBER	REMOVAL TIME (USAGE SINCE NEW)
Forward Rotary-Wing Transmission (114D1001)	A-7-68	400
	A-7-18	800
	A-7-21	800
	A-7-65	800
	A-7-83	800
	A-7-90	800
	A-7-185	800
Aft Rotary-Wing Drive Transmission (114D2001)	M-9-6	400
	A-9-46	400
	A-9-48	400
	A-9-86	600
	A-9-97	600
	A-9-119	600
	A-9-157	
Engine Combining Transmission (114D5001)	A-8-27	1200
	A-8-35	1200
	A-8-54	1200
Aft Rotary-Wing Drive Shaft (Vertical Shaft) (114D3002)	M-139	1600
Forward and Aft Swashplate	A-84-019	800
	A-84-029	800
	A-84-047	800
	A-84-054	800
	A-84-065	800
	A-84-068	800
	A-84-071	800

Table 1-16. Calendar Overhaul and Retirement Schedule

COMPONENT	PART NO.	OVERHAUL INTERVAL	RETIREMENT INTERVAL
Winch, Cable Cutter	TA97155		1 year*
Engine, Fire Extinguisher Cartridge	841155, 895188		30 months****
Engine, Fire Extinguisher Cartridge	13083-5 (use with 30402103 bottle) 895408 (use with 892868-02 bottle)		42 months*** 4 years**

NOTE

Shelf life is computed from the date of manufacture until current date. Service life begins upon opening of sealed cartridge container. Shelf life and service life cannot be added.

NOTE

All unserviceable cartridges shall be tagged with NSN, installation date, removal date, reason for removal, lot number, helicopter type/model and serial number, aviation unit destination and returned to supporting ammunition supply activity in the container used to transport the replacement cartridge.

* Life not to exceed 8 years of shelf life or 1 year of service life, whichever occurs first.

**Life not to exceed 6 years of shelf life or 4 years of service life, whichever occurs first.

***Life not to exceed 8.5 years of shelf life or 42 months of service, whichever occurs first.

****Life not to exceed 12 years of shelf life or 30 months of service life, whichever occurs first.

Table 1-17. Retirement of Selected Serialized Rotor Blades

(Does not apply to rotor blades with ISIS installed)

COMPONENT	SERIAL NUMBER	REMOVAL TIME (USAGE SINCE NEW)
Fwd Rotary Wing Blade 114R1502-Series	A-1-41	1688
	A-1-81	900
	A-1-031	2737
	A-1-084	2154
	A-1-170	900
	A-1-199	1992
	A-1-234	2497
	A-1-262	900
	A-1-291	900
	A-1-300	900
	A-1-322	2409
	A-1-326	1746
	A-1-369	1372
	A-1-374	900
	A-1-397	900
	A-1-424	2428
	A-1-448	1727
	A-1-452	1422
	A-1-480	1179
	A-1-533	1101
	A-1-607	900
	A-1-672	2650
	A-1-737	1534
	A-1-757	2084
	A-1-774	2084
	A-1-809	2084
	A-1-873	1800
	A-1-905	1994
	A-1-1054	1317
	A-1-1068	1300
	A-1-1118	1216
	A-1-1130	1623
	A-1-1164	1737
	A-1-1184	1989
	A-1-1269	1950
	A-1-1296	2244
	A-1-1327	2800
	A-1-1357	2200
	A-1-1360	2062
	A-1-1446	2050
	A-1-1521	1596
	A-1-1527	1894
	A-1-1622	1260
	A-1-1623	1261
	A-1-1632	1260
	A-1-1714	2040
	A-1-1856	1595
	A-1-1987	1148
	A-1-1999	1111
	A-1-2019	1270
	A-1-2084	1496
	A-1-2087	1270
	A-1-2464	1475
	A-2-126	2251
Aft Rotary Wing Blade 114R1502 Series	A-2-163	400
	A-2-334	400
	A-2-352	400
	A-2-361	400
	A-2-363	980
	A-2-380	400
	A-2-384	400
	A-2-385	400
	A-2-392	400
	A-2-397	400
	A-2-404	400
	A-2-421	803
	A-2-429	400
	A-2-429	400
	A-2-661	1102
	A-2-710	400
	A-2-860	400
	A-2-924	1043
	A-2-1069	1087
	A-2-1116	994
	A-2-1177	753
	A-2-1186	1305
	A-2-1222	958
	A-2-1273	1900

Table 1-17. Retirement Selected Serialized Rotor Blades — Continued

COMPONENT	SERIAL NUMBER	REMOVAL TIME (USAGE SINCE NEW)
	A-2-1297	400
	A-2-1403	1382
	A-2-1412	479
	A-2-1455	645
	A-2-1480	987
	A-2-1538	1650
	A-2-1558	885
	A-2-1579	667
	A-2-1587	667
	A-2-1627	1325
	A-2-1639	1000
	A-2-1709	994
	A-2-1809	785
	A-2-1841	972
	A-2-1848	2000
	A-2-1935	400
	A-2-1949	528
	A-2-1987	528
	A-2-2086	1771
	A-2-2218	1458
	A-2-2431	1119
	A-2-2603	911

Text Deleted

All data on pages 1-137 thru 1-138.1/1-138.2 deleted.

Table 1-18. Special Inspection Intervals for Selected Rotor Blades

NOTE

All forward and aft metal rotor blades, 114R1502-9 thru -44 have been initially inspected for fairing core corrosion. Refer to para 1-121.b. for inspection requirements.

Table 1-19. Removal of Selected Serialized Rotor Head Assemblies

PART NO.	SERIAL NUMBER	PART NO.	SERIAL NUMBER
114R2003-3	A-4-476 A-4-704 A-4-758 A-4-1163	114R2004-4	A-5-498 A-5-502 A-5-538 A-5-750 A-5-784 A-5-1053

Table 1-20. Replacement of Upper Rotor Controls Bolts (4000 Hours)

BOLT	PART NO	CH-47B	CH-47C T55-L-7	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (METAL ROTOR BLADES)	CH-47C T55-L-11 SERIES OR T55-L-712 ENG (FIBERGLASS ROTOR BLADES)
Bolt, Fwd Swiveling Actuator to Swashplate	114R3650-3	Replace	Replace	Replace	Replace
Bolt, Aft Swiveling Actuator to Lower Attach	BACB30ST8-29	N/A	N/A	Replace	Replace
Bolt, Fwd Pivoting Actuator to Swashplate	114R3650-3	Replace	Replace	Replace	Replace
Bolt, Aft Pivoting Actuator Lower Attach	BACB30ST8-35	Replace	Replace	Replace	Replace
	BACB30ST8-31	Replace	Replace	Replace	Replace
Bolt, Aft Pitch Link to Rotor Head	114R3650-13	Replace	Replace	Replace	Replace
Bolt, Aft Pitch Link to Swashplate	114R3650-15	Replace	Replace	Replace	Replace
Bolt, Fwd Swiveling Actuator to Transmission Cover	BACB30ST8-32	N/A	N/A	N/A	Replace

CHAPTER 2
AIRFRAME

GENERAL INFORMATION

2-1. General.

This chapter contains information on specific and typical repairs to the fuselage and pylon assemblies. The information will be used at the Aviation Unit Maintenance level (AVUM) and the Aviation Intermediate Maintenance level (AVIM). Refer to appx B for a description of AVUM and AVIM assigned maintenance functions. Refer to TM 55-1500-204-25/1 for general aircraft maintenance procedures.

2-2. Type of Construction.

The CH-47B and CH-47C helicopters are tandem-rotor, twin-engine aircraft of semimonocoque construction. Structural repair information is provided for the three major assemblies which comprise the fuselage and for the aft pylon structure assembly. See fig. 2-1 for general arrangement and assembly identification.

2-3. Fuselage.

The fuselage assemblies are as follows:

a. Cockpit fuselage structure assembly and associated fairings, doors, hatches, floors, and equipment support structure.

b. Cabin fuselage structure assembly and associated doors, floors, and equipment support structure, and the tunnel cover and pod installations.

c. Aft fuselage structure assembly and associated equipment support assemblies, and the cargo loading ramp installation.

Access doors, covers and panels are installed on the exterior surface of the fuselage for different phases of aintenance and inspection. See fig. 2-2 for locations of access doors, covers, and panels. Internally, the fuselage contains crew and troop seating, provisions for litters, accoustic insulation, removable flooring, and miscellaneous equipment. External pods house the fuel tanks, the landing gear support structure, and certain components of the electrical and engine condition control systems.

Much of the information contained in this section is of a general nature, and does not include detailed repair and/or replacement methods for specific failures. However, detailed repair information has been included for those failures which have appeared on a recurring basis, and letailed replacement information has been included for those items requiring specific replacement instructions. Table 2-1 lists the location of specific inspection, repair, and replacement criteria, for components of the fuselage and pylon assemblies.

2-3.1 Helicopter Security. (See fig. 2-2.1).

The helicopter is equipped with door lock security devices. These devices prevent interior access to the helicopter by unauthorized persons. Install the devices as follows:

a. Be sure the ramp is in the full up position. Install the cable hook thru the ramp controls access door latch. Secure the fastener to the bracket. Be sure the warning streamer is visible.

b. Close the lower rescue hatch door. If the door cannot be closed, secure the inside door to a tiedown ring with a cargo strap.

c. Secure the release straps of the two cabin escape hatches and the cargo door escape hatch with restraining clamps. Be sure the clamps are located as close to the release grommet as possible. Be sure the warning streamers are are ready visible.

d. Install lock pins thru the pilot's and copilot's window latches. Then insert the quick-release pin thru the bracket on the floor and into the door latch plate. Be sure the warning streamers are readily visible.

e. Close the cabin doors. Install the bracket on the door handles. Secure the bracket witht he padlock.

2-4. Pylon.

The aft pylon structure assembly is secured to the aft fuselage structure assembly. The pylon assembly provides support for the aft transmission, drive shaft, transmission cooling fan, and various flight control components. Refer to fig. 2-1 for assembly arrangement and fig. 2-2 for access openings.

2-5. Inspection of Damage—General.

For information for determining depth of nicks and scratches, differentiating between magnesium and aluminum parts, determining type of aluminum alloy, and detecting unbonding and ply separations, refer to TM 55-1500-204-25/1.

2-6. Inspection of Damage—Specific.

Criteria for specific investigations of components for the fuselage and pylon assemblies are given in the following paragraphs.

2-7. *Fuselage and Pylon.*

Investigate damage as follows:

a. If original damage was caused by severe impact, and alignment of structure is required, return helicopter to depot.

b. Check all plates, clips, and doublers in area of damage for distortion, security, and elongated holes.

c. Check bulkheads, formers, stringers, supports, beams, decks, and longerons for distortion, cracks, nicks, dents, scratches, elongated holes, and loose or missing rivets or bolts.

d. Check body skin for holes, dents, scratches, cracks, loose or missing rivets, and oil canning. Refer to para 2-635 for oil can inspection and repair. Specific inspection procedures pertinent to bottom skin surfaces are contained in para 2-636.

e. Check all access doors and panels for cracks, dents, distortion, and security. Check seals for damage and security.

f. Check entire fuselage structure for watertight sealing. Refer to para 2-554 for information on resealing. Inspect the following areas with particular care:

(1) Access doors and panels

(2) Maintenance steps and handgrips

(3) Manufacturing splices and seams

(4) All external electrical plugs and connectors

(5) Windows and enclosure

(6) Under cabin fuselage section floor for moisture and corrosion

2-8. *Inspection—Lightning Strike.*

Data on helicopters struck by lightning shows that most damage has been to the rotor system. (Refer to para 5-87

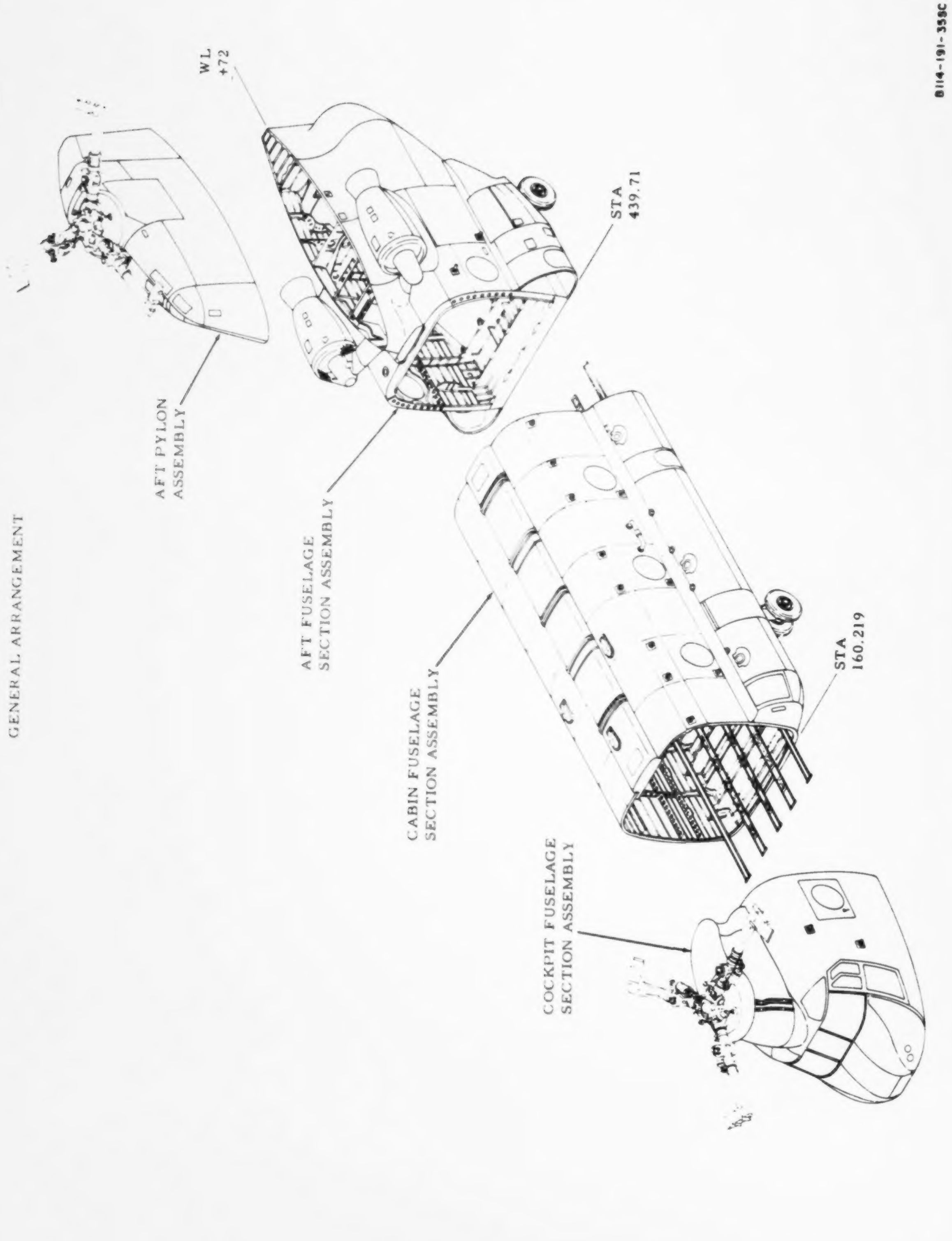
GENERAL ARRANGEMENT
AFT PYLON ASSEMBLY
WL +72
AFT FUSELAGE SECTION ASSEMBLY
STA 439.71
CABIN FUSELAGE SECTION ASSEMBLY
STA 160.219
COCKPIT FUSELAGE SECTION ASSEMBLY
B114-191-355C

Figure 2-1. General Arrangement and Component Groups

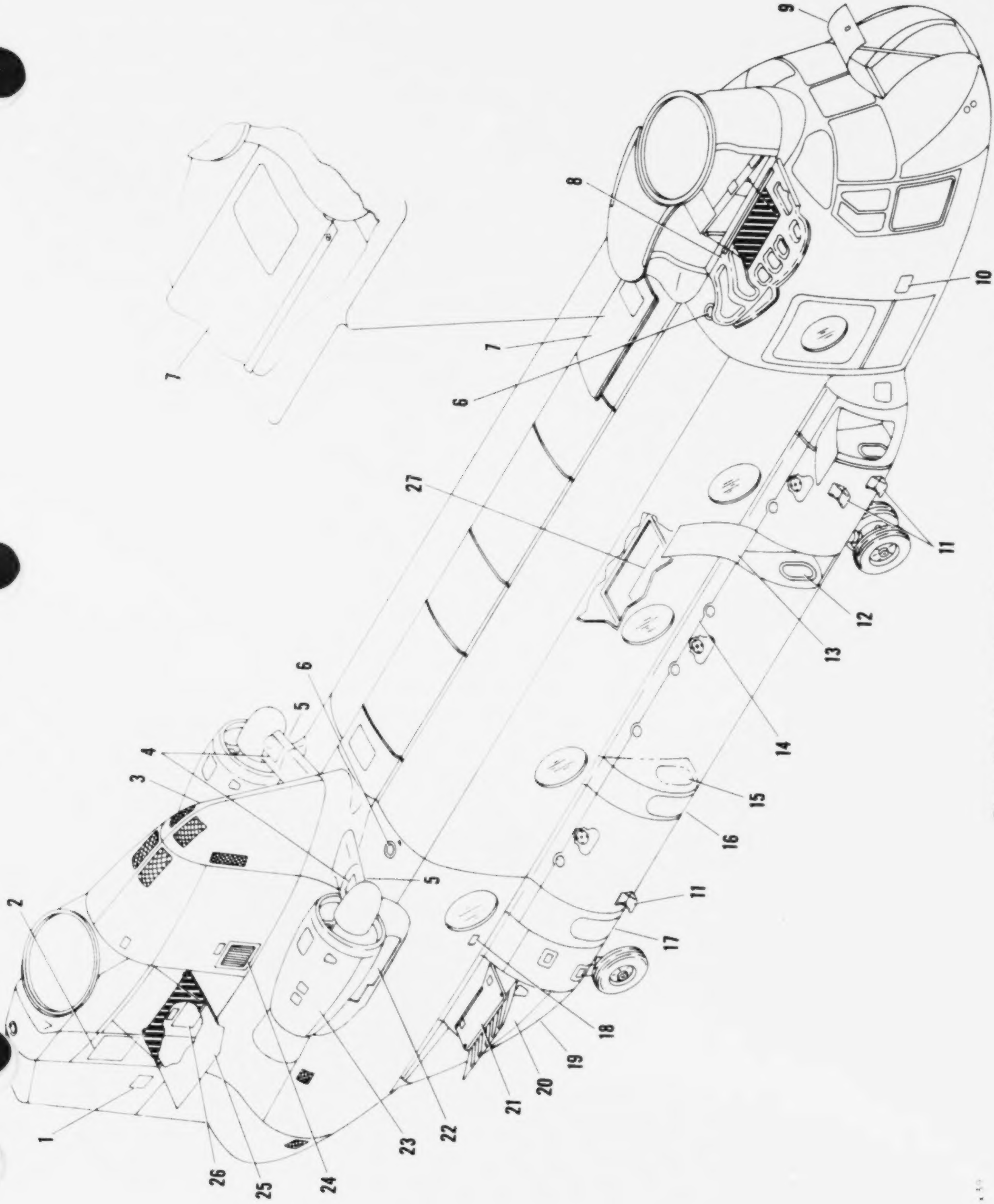
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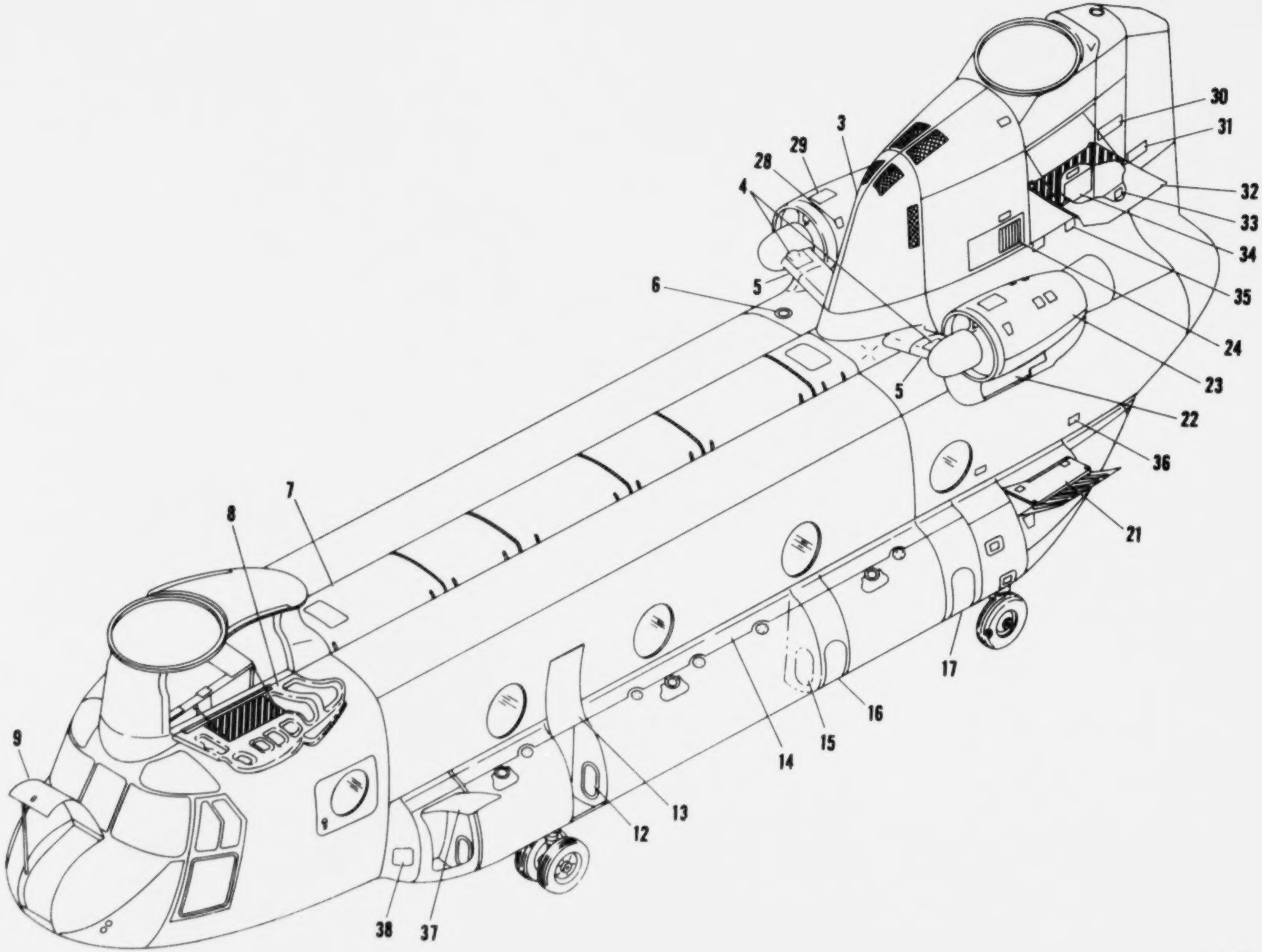
Figure 2-2. Access Doors, Covers, and Panels (Sheet 1 of 2)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12
37
38
54 x 39
B114-284-20R

Figure 2-2. Access Doors, Covers, and Panels (Sheet 2 of 2)

Legend for figure 2-2

1. Pylon removal access panel
2. Vibration absorber access panel
3. Pylon leading edge hinged fairing
4. Upper hinged access panel
5. Lower hinged access panel
6. Maintenance crane installation access panels
7. Cabin crown access tunnel covers
8. Work platform
9. Nose compartment access door
10. Interphone jack access door
11. Fuselage foldout steps
12. Forward fuel boost pump access panel
13. Forward landing gear access panel
14. Pod to fuselage fairing
15. Aft fuel boost pump access panel
16. Center pod access panel
17. Aft pod access panel
18. Aft interphone jack and ramp control access door
19. Aft landing gear access panels
20. Aft landing gear fairings
21. Work platform
22. Lower access door
23. Engine upper cover
24. Blower inspection access cover
25. Work platform
26. Aft transmission access cover
27. Rescue hatch lower door
28. Engine oil quantity indicator access door
29. Engine oil filler access door
30. Vibration absorber access panel
31. Pylon removal access panel
32. Work platform
33. Utility hydraulic pump access panel
34. Aft transmission access cover
35. Aft transmission oil filler access door
36. Apu emergency fluid shutoff access panel
37. Electrical compartment access panel
38. External power receptacles access door

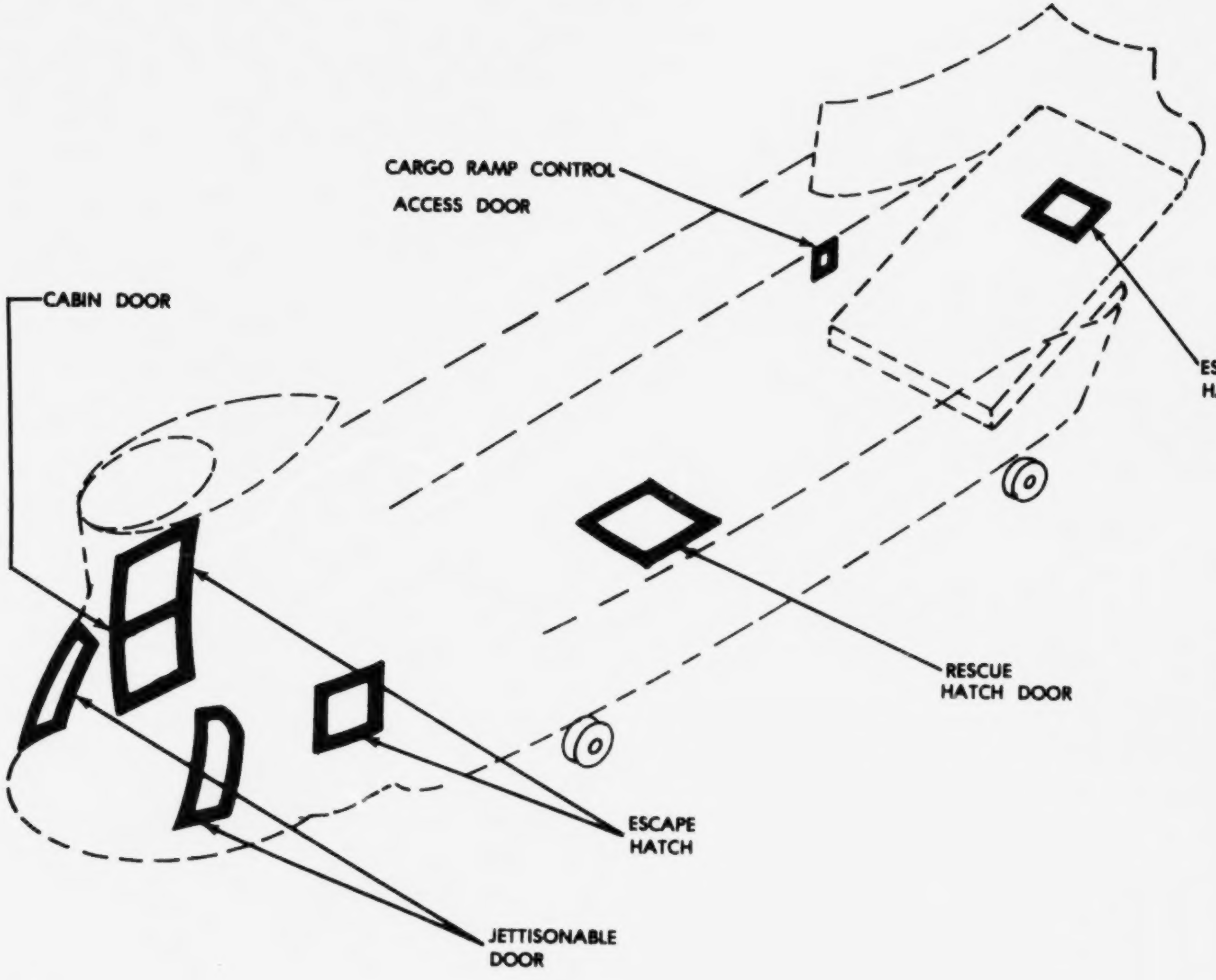

CARGO RAMP CONTROL
ACCESS DOOR
CABIN DOOR
ESCAPE
HATCH
RESCUE
HATCH DOOR
ESCAPE
HATCH
JETTISONABLE
DOOR

Figure 2-2.1. location of CH-47 Locking Devices

Table 2-1. Specific Inspection, Repair, and Replacement Criteria Reference

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Access door, electrical compartment	2-217	2-63 sh 9	
Access panel, aft landing gear	2-401		
Access panel, fuel pump	2-217	2-63 sh 9	
Access panel, landing gear	2-217	2-63 sh 8	
Aft crown inner skin, repair of	2-19		
Aft fuselage structure assembly	2-382		
Aft pylon structure assembly		2-115	
Auxiliary power unit enclosure, tailcone	2-429		
Backing board assembly	2-246		
Backing board assembly		2-70 sh 3	
Beam repairs, bl 45.40		2-15 sh 17	
Beam repairs, cargo tiedown adapter		2-15 sh 8 thru 14	
Beam repairs, forward landing gear support		2-15 sh 7	
Beam repairs, wl 0.0		2-15 sh 5	
Beam repairs, wl −16		2-15 sh 4	
Beam, rescue hoist		2-15	
Beam splice, aluminum floor		2-15	
Beams, aft fuselage structure assembly	2-44		
Beams, aft pylon structure assembly	2-44		
Beams, cabin fuselage structure assembly	2-44		
Beams, cockpit — fuselage structure assembly	2-44		
Beams, rescue hoist cutout		2-15 sh 16	
Bracket, support, cabin dome light		2-85 sh 4	
Bracket, support — N, control box, sta 180 and 200		FO-3	
Bracket, support, tunnel cover		2-86	
Bulkhead repair, sta 95 — cockpit fuselage structure assembly		2-14	
Bulkhead, sta 95	2-39		
Cabin, fuselage structure assembly	2-3		
Cargo door coaming	2-432		
Cargo hook support-cabin fuselage structure assembly		2-85 sh 1	
Corrosion limitations, floor panel			2-10
Deck repairs, aft pylon structure assembly — wl +72		2-115	
Decks, aft pylon structure assembly — wl +72, +90.75, and +119.28	2-487		
Deck repairs, tailcone — aft fuselage structure		2-99	
Door assembly, cargo	2-457		

Table 2-1. Specific Inspection, Repair, and Replacement Criteria Reference—Continued

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Door, cabin — coaming	2-138		
Door, Cabin repairs — cockpit fuselage structure assembly	2-115		
Door, nose compartment	2-109	2-30	
Doors and access panels	2-217		
Doors, Jettisonable — pilot and copilot	2-77		
Drive shaft supports, sta 160, 210, 260, 310, 360, and 410-cabin fuselage structure assembly		2-85 sh 2	
Enclosure, cockpit — fuselage structure assembly	2-57		
Equipment support structures, cabin fuselage structure assembly	2-324		
Equipment support structures, aft fuselage structure assembly	2-324		
Equipment support structures, aft pylon structure assembly		2-119	
Equipment support structures, cockpit fuselage structure assembly		2-37	
Escape hatch	2-122		
Fairing, aft — aft fuselage structure assembly	2-387		
Fairing repairs, aft pylon assembly		FO-8	
Fairing assembly, pod	2-406		
Fairing, crown — aft	2-518		
Fairing, crown — fwd	2-509		
Fairing, drive shaft and engine transmission — aft fuselage structure assembly		2-97 sh 1	
Fairing, fixed — fwd pylon	2-95		
Fairing, fixed — lower pylon leading edge	2-390		
Fairing, hinged — lower pylon leading edge (glass cloth type)	2-393	2-97 sh 1	
Fairing, hinged — lower pylon leading edge (sandwich honeycomb-type)	2-393		
Fairing, mid-crown	2-515		
Fairing, pod		2-98	
Fairing, pod installation — aft fuselage structure assembly	2-400		
Fairing, pod-to-fuselage	2-227		
Fairings, doors and access panels — cabin fuselage structure assembly	2-217		
Fairings, doors and access panels — cockpit fuselage structure assembly	2-95		
Fairings, doors and access panels — aft fuselage structure assembly	2-383		
Fairings, work platform		2-27 sh 3	
Floor, web and one leg damage		2-88 sh 1	
Floor, cargo rail damage		2-88 sh 2	
Floor repairs, cockpit fuselage structure assembly		2-40	
Flooring repairs, cargo ramp		2-12 sh 21	
Former repairs, sta 120 — cockpit fuselage structure assembly		2-9 sh 6	
Former repairs, sta 160 — cockpit fuselage structure assembly		2-9 sh 8	
Former repairs, sta 160 — cabin fuselage structure assembly		FO-3 sh 1	
Former repairs, sta 200 — cabin fuselage structure assembly		FO-3 sh 2	
Former repairs, sta 240 — cabin fuselage structure assembly		FO-3 sh 3	
Former repairs, sta 280 and 320 — cabin fuselage structure repairs		FO-3 sh 4	
Former repairs, sta 360 and 400 — cabin fuselage structure assembly		FO-3 sh 5	
Former repairs, sta 440 — cabin fuselage structure repairs		FO-3 sh 10	
Former repairs, sta 440 — aft fuselage structure assembly		2-11 sh 1	
Former repairs, sta 482.0 — aft fuselage structure assembly		2-11 sh 5 and 7	
Former repairs, sta 502.437 — aft fuselage structure assembly		2-11 sh 9	

Table 2-1. Specific Inspection, Repair, and Replacement Criteria Reference—Continued

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Former repairs, sta 520 — aft fuselage structure assembly		2-11 sh 11	
Former repairs, sta 534 — aft fuselage structure assembly		2-11 sh 12	
Former repairs, sta 555 — aft fuselage structure assembly		2-11 sh 16	
Former repairs, sta 575.5 — aft fuselage structure assembly		2-11 sh 18	
Former repairs, sta 594 — aft fuselage structure assembly		2-11 sh 21	
Former repairs, sta 594 to 630 — tailcone		2-99	
Former repairs, ramp assembly, sta 488.33 and ramp sta 10.077, 26.30, and 37.526 — aft fuselage structure assembly		2-12 sh 10	
Former repairs, ramp assembly, sta 53.04, 60.63, 68.246, 83.60, and 98.955 — aft fuselage assembly		2-12 sh 12	
Former repairs, bottom, sta 460 — aft fuselage structure assembly		2-11 sh 3	
Former repairs, bottom, sta 482 — aft fuselage structure assembly		2-11 sh 7	
Former repairs, crown, sta 180, 220, 260, 300, 340, 380, and 420 — cabin fuselage structure assembly		FO-3 sh 9	
Former repairs, crown, sta 460 — aft fuselage structure assembly		2-11 sh 3	
Former repairs, floor, sta 51.75, 70.62, 95 and 120 — cockpit fuselage structure assembly		2-9 sh 1	
Former repairs, floor, sta 140 and 160 — cockpit fuselage structure assembly		2-9 sh 3	
Former repairs, full, sta 534, 575.5, and 594 — aft pylon structure assembly		2-13 sh 1	
Former repairs, partial, sta 260 — cabin fuselage structure assembly		FO-3 sh 1	
Former repairs, pod, sta 170 and 187.31 — cabin fuselage structure assembly		2-10 sh 1	
Former repairs, pod, sta 189.41, 238, 262.16, 372.36, 389.91, and 438.5 — cabin fuselage structure assembly		2-10 sh 2	
Former repairs, pod, sta 482 — cabin fuselage structure assembly		2-10 sh 3	
Former repairs, side, sta 110.5 — cockpit fuselage structure assembly		2-9 sh 5	
Former repairs, side, sta 180, 212.76, 225.4, 270, 293.3, 306.7, 333.3, 346.7, 372.38, 384.89, 413.31, 410.3, and 426.5 — cabin fuselage structure assembly		FO-3 sh 9	
Former repairs, side, sta 189.35, 238.06, 262.10, and 372.42 cabin fuselage structure assembly		FO-3 sh 10	
Former repairs, side, sta 460 — aft fuselage structure assembly		2-11 sh 3	
Hinge repairs — cabin fuselage structure assembly		2-68	
Hinge tunnel installation, ramp	2-435		
Hinges, structural	2-327		
Isolation panel assemblies	2-266		
Latch plates, forward pylon — replacement of		2-27 sh 2	
Longerons, cabin — fuselage structure assembly	2-34		
Longerons, cockpit — fuselage structure assembly	2-34		
Longeron repair, sta 118 — cockpit fuselage structure assembly		FO-4	
Pane assembly repair, cockpit — fuselage structure assembly	2-64		
Pylon, forward — structure and fairing — cockpit fuselage structure assembly		2-27	
Non-skid paint application, cargo flooring		2-88 sh 3	
Non-skid paint application, cargo loading ramp		2-12 sh 7	
Ramp repairs, auxiliary cargo loading — aft fuselage structure assembly		2-12 sh 1	
Ramp repairs, cargo loading — aft fuselage structure assembly		2-12 sh 1	
Rescue hatch coaming repairs — cabin fuselage structure assembly	2-299	2-78	
Skin, aft fuselage assembly	2-19		
Skin, inner aft crown, sta 440 to 482, repair	2-22		
Skin, repairs, body		2-5	
Stringer and stiffener identification		FO-2	

Table 2-1. Specific Inspection, Repair, and Replacement Criteria Reference—Continued

NOMENCLATURE	PARA NO.	FIG NO.	TABLE NO.
Stringer, cockpit — fuselage structure assembly	2-24		
Strakes, cargo ramp — aft fuselage structure assembly		2-12 sh 9	
Strakes, pod — cabin fuselage structure	2-316	2-83	
T-cap, pod installation		2-70	
Tailcone, auxiliary power unit enclosure	2-429	2-99	
Tailcone repairs — aft fuselage structure assembly		sh 1	
Tailcone repairs — deck wl +72		2-99 sh 4	
Tailcone repairs — deck sta 594 to 629.98		2-99 sh 5	
Tailcone repairs — structure lh side		2-99 sh 2	
Tailcone repairs — structure rh side		2-99 sh 3	
Troop seats	2-347		
Troop seats, back and litter pole beams, wl +29 — cabin fuselage structure assembly		2-15 sh 6	
Tunnel covers (glass cloth type)	2-219		
Tunnel covers (sandwich honeycomb)	2-219		
Tunnel cover support bracket repair		2-86	
Walkway repair, cabin crown — cabin fuselage structure assembly	2-226	2-64	
Window and windshield optical areas enclosure repairs cockpit fuselage structure assembly		FO-5	
Window panes and framing repairs — cabin fuselage structure assembly	2-414	2-79	
Windshield and pane assembly surface finishing	2-67		
Windshield inspection	2-66		
Windshield sealing		FO-5 sh 2	
Work platform and fairing assembly	2-409		

and 5-7.) However, the helicopter must also be inspected for possible damage to the fuselage, wiring, components and operating systems. Inspect for lightning damage as follows:

a. Inspect the fuselage interior and exterior, the forward and aft landing gear, all wheels and tires, and the static ground wire on the aft left landing gear for burn marks and pitting.

b. Inspect wiring in tunnel areas and exposed areas for burns.

c. Inspect antennas for burns and pitting.

d. Visually inspect all electrically operated components and lighting systems for damage.

e. Visually inspect communication and navigation equipment for damage.

f. Visually inspect SAS components for damage.

g. Perform an operational check of the flight control system. (Refer to para 11-85.)

h. Perform a ground run maintenance operational check of the helicopter. Functionally check the SAS, all electrical and lighting systems, and the communication and navigation systems.

i. Check the magnetic compass for accuracy.

j. Repair any damage and replace damaged components as required using standard maintenance practices.

k. Inspect all sync drive shafts and aft vertical shaft for blistered paint or arc burns. Any arc burns would be cause for rejection since the untempered martensite (rehardened metal) is generally brittle and has a tendency to crack. This is usually detrimental to the fatigue life of the shaft.

l. Inspect all sync drive shaft bearings for arc burns, seized or spot welded bearings and bearing sleeves. Any of the above damage would be cause for rejection.

m. Inspect all rotating or self-aligning control rod end bearings (to include pitch change links) for arc burns, seizure or interference of movement. Any of the above would be cause for rejection.

n. Inspect aircraft for residual magnetism. If evident, aircraft should be degaussed to remove the magnetism.

2-9. Helicopter Vibration Analysis.

Vibrations generated by malfunctioning, out-of-balance, or worn components on the helicopter can be amplified by the airframe. Such vibrations can cause discomfort to personnel, damage to cargo, and, in some cases, damage to the helicopter. The two types of vibration are airframe vibration and component vibration.

a. Airframe vibrations. Most airframe vibrations are produced by operation of the rotary-wing system. During flight, malfunctioning, out-of-balance, or worn

components can cause excessive vibration. These occur primarily as one cycle of vibration for each revolution of the rotor shafts (one per rev), three cycles of vibration for each revolution (three per rev), or six cycles of vibration for each revolution (six per rev). Vibration frequency in cycles per second can be determined by dividing the rotor rpm by 60.

b. Component vibrations. Component vibrations are produced by out-of-balance or wear conditions on any of the rotating components. These vibrations occur at the rotating speeds of the components and can be detected in the airframe adjacent to the affected component during ground or flight operation. Vibration frequency in cycles per second can be determined by dividing the component rotating rpm by 60. (Refer to table 2-2 for component speeds corresponding to rotor rpm or to table 2-2.1 for component speeds corresponding to engine rpm.)

Table 2-2. Component Relative Speeds

COMPONENT	CH-47B (225 ROTOR RPM) METAL ROTOR BLADES WITH T55-L-7 SERIES ENGINES		CH-47C (230 ROTOR RPM) METAL ROTOR BLADES WITH T55-L-7 SERIES ENGINES		CH-47C (235 ROTOR RPM) METAL ROTOR BLADES WITH T55-L-11 SERIES AND 712 ENGINES		CH-47C (225 ROTOR RPM) FIBERGLASS ROTOR BLADES T55-L-11 SERIES AND 712 ENGINES	
	RPM	CYCLES PER SECOND	RPM	CYCLES PER SECOND	RPM	CYCLES PER SECOND	RPM	CYCLES PER SECOND
Rotor hubs	225	3.75	230	3.83	235	3.92	225	3.75
Forward transmission								
Rotor shaft and upper stage carrier	225	3.75	230	3.83	235	3.92	225	3.75
Upper stage planet gears (6 each) about post	723	12.05	739	12.31	755	12.58	723	12.05
Upper stage sun and lower stage carrier	821	13.68	840	14.00	858	14.30	821	13.68
Lower stage planet gears (4 each) about post	2232	37.18	2282	38.02	2333	38.89	2232	37.18
Lower stage sun bevel and accessory drive gear	3930	65.52	4018	66.96	4109	68.41	3930	65.50
Oil pump gear	4402	73.37	4500	75.00	4597	76.63	4402	73.37
Bevel input pinion gear	6912	115.2	7065	117.75	7219	120.32	6912	115.20
Aft transmission								
Same as corresponding forward transmission components (except oil pump)	Same as for corresponding forward transmission components (except oil pump)							
Oil cooler blower shaft	4785	79.75	4891	81.52	4998	83.30	4785	79.75
Accessory section takeoff gear	3930	65.52	4018	66.96	4105	68.42	3930	65.50
Accessory section drive gear	8079	134.65	8258	137.60	8438	140.63	8079	134.65
Utility hydraulic motor	7818	130.30	7459	124.32	7621	127.02	7297	121.62
Oil pump	4573	76.22	4363	72.72	4458	74.30	4268	71.13
Alternators	8357	139.28	7973	132.88	8146	35.77	7800	130.00
Flight control hydraulic pumps	3909	65.15	3729	62.20	3810	63.50	3648	60.80
Engine combining transmission								
Collector gear and sync shafts	6912	115.20	7065	117.80	7219	120.32	6912	115.20
Cross shaft input	11729	195.48	11990	199.83	12250	204.20	11729	195.48
Oil pump	4915	81.92	5024	83.73	5133	85.55	4915	81.92
Engine transmission								
Engine input and power turbine speed	14410	240.17	14730	245.50	15051	250.84	14410	240.17
Cross shaft output and high-speed shafts	11729	195.48	11990	199.83	12250	204.20	11729	195.48
Rotor harmonics								
3 per rev	675	11.25	690	11.50	705	11.75	675	11.25
6 per rev	1350	22.50	1380	23.00	1410	23.50	1350	22.50

Table 2-2. Component Relative Speeds—Continued

COMPONENT	CH-47B WITH T55-L-7 SERIES ENGINES (225 ROTOR RPM)		CH-47C WITH T55-L-7 SERIES ENGINES (230 ROTOR RPM)		CH-47C WITH T55-L-11 SERIES ENGINES (235 ROTOR RPM)	
	RPM	CYCLES PER SECOND	RPM	CYCLES PER SECOND	RPM	CYCLES PER SECOND
Engine compressor (Independent of rotor rpm)						
Compressor speed nl= 105%	19215	320.3	19215	320.3	19950	332.5
nl= 100%	18300	305.0	18300	305.0	19000	316.67
nl= 95%	17835	289.8	17385	289.8	18050	300.8
nl= 90%	16470	274.5	16470	274.5	17100	285.0
nl= 85%	15555	259.3	15555	259.3	16150	269.17
nl= 80%	14640	244.0	14640	244.0	15200	253.3
nl= 75%	13725	228.8	13725	228.8	14250	237.5
nl= 70%	12810	213.5	12810	213.5	613300	221.67

Table 2-2.1. Engine Relative Speeds

COMPONENT	CH-47B/C ALL SERIES ENGINES	
	RPM	CYCLES PER SECOND
Engine compressor (Independent of rotor rpm)		
Compressor speed N1 = 105%	19656	327.6
N1 = 100%	18720	312.0
N1 = 95%	17784	296.4
N1 = 90%	16848	280.8
N1 = 85%	15912	265.2
N1 = 80%	14976	249.6
N1 = 75%	14040	234.0
N1 = 70%	13104	213.4

2-10. Vibration Troubleshooting.

Refer to table 2-3 for airframe structure vibration troubleshooting. Refer to table 6-1 for drive shafting troubleshooting. Refer to table 5-3 for vibration information on the rotary-wing system. Refer to table 11-7 for interrelated vibration information on the flight control system.

2-11. Classification of Damage.

Following inspection, damage should be classified as negligible damage, reparable damage, or damage necessitating replacement.

2-12. Negligible Damage.

Negligible damage is that damage which can be permitted to exist as is, or can be corrected by a simple procedure without placing restrictions on flight. Simple procedures include stop-drilling of a crack, burnishing or blending of a scratch or nick, removal of a dent, application of a temporary fabric patch and filling a small hole with a rivet. Cracks should be stop-drilled at each sharp corner of crack and at end of crack. Use a $\frac{3}{32}$-inch diameter drill. Scratches on internal webs and formed parts may be classified as negligible if they are not deeper than 10 percent of web thickness after burnishing. Scratches must not be deeper than 10 percent of thickness of thinnest leg after burnishing. Scratches are not permitted on radiuses of any part. Nicks, dents, cracks, and scratches, exceeding 10 percent depth limitation for formed parts, are negligible only if they can be cleaned out to a round hole which can be classified as negligible. No unrepaired holes are permitted in any internal web. Holes, $\frac{3}{16}$-inch diameter or over, must be plugged with a tight-fitting rivet or bolt. Damage classified as negligible must clear all internal radiuses of formed parts, after burnishing. Two adjacent damages, to be classified as negligible, must be separated by a 4-inch formed parts, after burnishing. Two adjacent damages, to be classified as negligible, must be separated by a 4-inch length of undamaged material. The distance to be measured from edges of burnished areas. All cracks, scratches, holes, and burnished areas, classified as negligible, must be finished with a minimum of two coats of zinc chromate primer (C259) after rework. See fig. 2-3 for negligible damage examples.

NOTE

A paragraph containing a comprehensive definition of negligible damage applicable to a specific part, will follow the descriptive paragraph for that part.

2-13. Reparable Damage.

Damage exceeding specified negligible limits, but which is confined to a small area of a part is reparable by patching, subject to area involvement. Generally, a patch-type repair is one wherein the reinforcement need not represent the full cross section of a part. In webs, reinforcements need not extend from boundary member to boundary member. A filler, to compensate for thickness of original material removed in damaged area, is practical but should not be considered an insertion. Complete or composite damage is reparable by insertion of a partial replacement, identical to original. Partial replacement is accompanied by a reinforcement representing the full cross section of original part. In webs, partial replacements should extend from boundary member to boundary member. Fig. 2-4 will aid in classifying damage.

2-14. Damage Necessitating Replacement.

Damage that cannot be repaired, such as the loss of a major portion of a section of skin or former, or because of the complicated design of the part, necessitates replacement.

2-15. Types of Repair.

Following the classification of damage, a careful study should be made of each part in vicinity of damage to determine whether a satisfactory repair can be made or if a replacement is necessary. Consideration must be given to the period of time the helicopter will be in service between inspections and overhauls. Damage to any part of helicopter that has been determined as reparable, must be further classified as partial damage, complete damage, or composite damage. A study of fig. 2-4 will aid in choosing the type of repair.

2-16. *Partial Damage Repair.*

Damage to a structural part which, after proper pre-repair steps, does not remove more than one flange may be classified as partial damage and may be repaired by patching. Damage to skins or webs which, after pre-repair steps, is clear of adjacent structural parts, is considered partial damage and can be repaired by patching.

2-17. *Complete Damage Repair (AVIM).*

Damage greater than that defined as partial damage, or damage that removes the major portion of the cross section of a part can be classified as complete damage. Pre-repair steps that remove the heel of an extrusion, the radiuses of a formed part, or affect two flanges at any one location along the part can be classified as complete damage. A small part is generally easier to replace provided the part is available or can be made from available material. Several isolated skin damages too close to permit use of individual patches, or isolated damages that require removal of over half the skin or web area between adjacent structural parts can be classified as complete damage to skin. Complete damage, except where replacement is more practical, will necessitate repair by insertion.

2-18. *Composite Damage Repair (AVIM).*

Damage more extensive than that classified as negligible and occurring to both structural parts and attached skin or web can be classified as composite damage. In some cases the skin panel will be replaced and attached to the repaired part similar to the original attachment. An exception is the repair area of the part, where the attachments may be governed by the repair of the part. In other cases the skin will be patched when the part is repaired, the method of repair being determined individually for each of the parts under consideration. Extensive damage, such as numerous composite damages, where insufficient undamaged structure remains, or severe distortion or loss of primary parts will, in many instances, necessitate replacement of a structural assembly or complete section of the body group.

2-19. Skin.

The skin panels of the major assemblies of the fuselage and the aft pylon consist of aluminum alloy. Variances in skin fabrication materials, such as sandwich-honeycomb or fiberglass, are described in the appropriate component definition. Fig. 2-5 identifies the skin panels, original and repair material. Below the waterline, skin panels are sealed watertight. Above the waterline, the skin panels are sealed weathertight. Methods of skin repair are given in fig. 2-7.

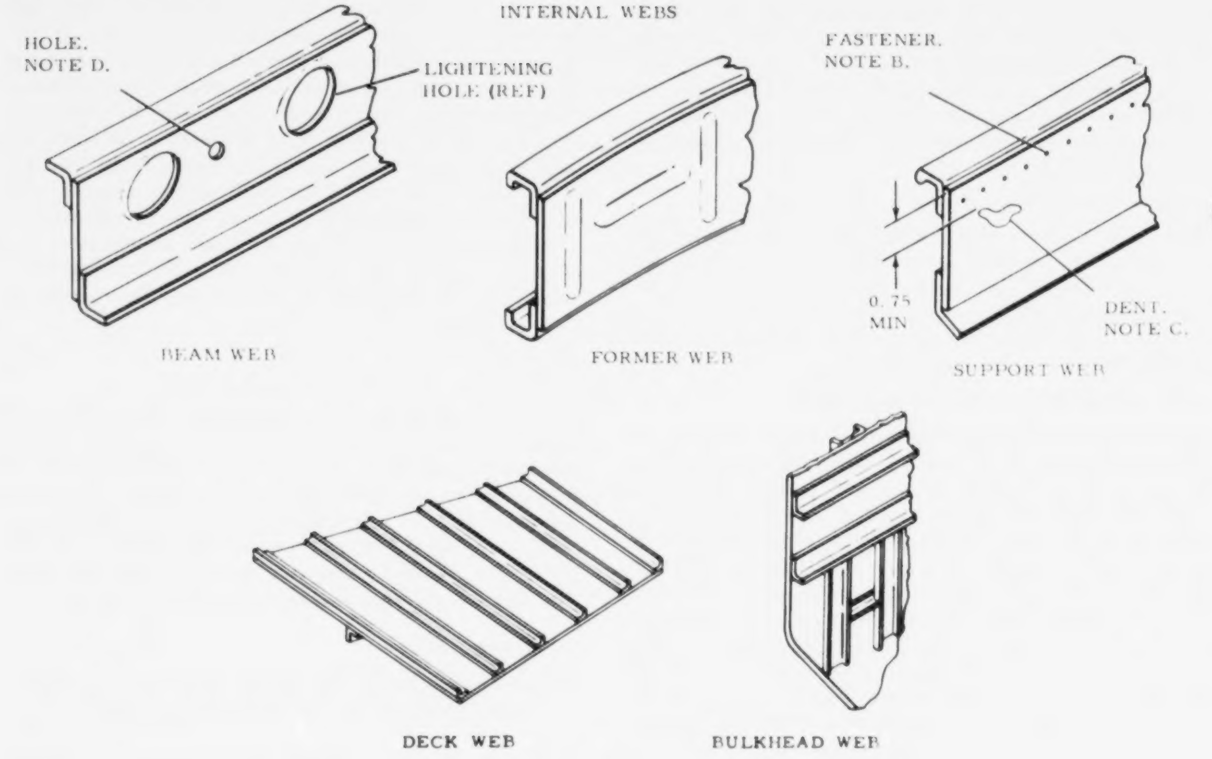
2-20. *Inspection.*

Following inspection, skin damage should be classified as negligible, reparable, or necessitating replacement.

2-21. Negligible Damage. Examples of negligible damage are nicks and scratches whose depth after burnishing does not exceed 10 percent of the thickness of the material. Holes and cracks must not exceed limits shown in fig. 2-6.

Table 2-3. Airframe Structure Vibration Malfunction Isolation Procedures

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Three-per-rev vibration and or unstable flight	Cargo loading (if vibration is present only while carrying cargo)	Check and correct location of cargo Check cargo weight and condition Check security of cargo. Check that specified floor loading is not exceeded
	Loose aft pylon splice bolts	Tighten to correct torque value
	Loose component support fitting	Tighten loose attaching bolts. Replace loose or sheared rivets. Replace cracked or damaged fittings.
	Loose engine, fairing, or tail cone	Check security of fairing or tail cone Check support fittings for looseness. Replace damaged or worn fittings.
	Loose landing gear, work platforms, access doors, ramps, escape panels, windows, or doors	Check for security, wear, and obvious looseness which could result in resonant chattering. Secure or replace components as required
Three-per-rev vibration during descent	Combining transmission mounts loose	Have combining transmission structural mounts repaired



NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. FASTENERS NEAR DAMAGE CLASSIFIED AS NEGLIGIBLE MUST BE CAREFULLY INSPECTED FOR SIGNS OF FAILURE SUCH AS TIPPING OF HEAD, CRACKING OF PRIMER COAT, AND CLEARANCE UNDERNEATH HEAD

C. SMOOTH DENTS, FREE FROM CRACKS AND ABRASIONS, CAN BE DISREGARDED IF EDGES OF DENT CLEAR EDGES OF STRUCTURAL MEMBERS, WEB SPLICES, LIGHTENING AND ACCESS HOLES, AND RADII BY AT LEAST 0.75

D. NO HOLES PERMITTED UNREPAIRED IN ANY WEBS

42x35

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Figure 2-3. Negligible Damage Examples (Sheet 1 of 2)

2-22. *Reparable Damage.* Reparable damage is more extensive than negligible damage. After pre-repair steps, reparable damage affects not more than 25 percent of skin area between boundary members and which clears structural members. Reparable damage requires less than a full skin panel insertion. Fig. 2-7 shows this type of repair.

2-23. *Damage Necessitating Replacement (AVIM).* This level of damage may be caused by extensive skin damage or numerous isolated damages. Replacement of a full panel is necessary. Sandwich-honeycomb panels should be replaced with panels of the same type and installed in the same manner. Skin panels are replaced along original boundary members. Joints and seams are sealed the same as the original installation.

2-24. Stringers.

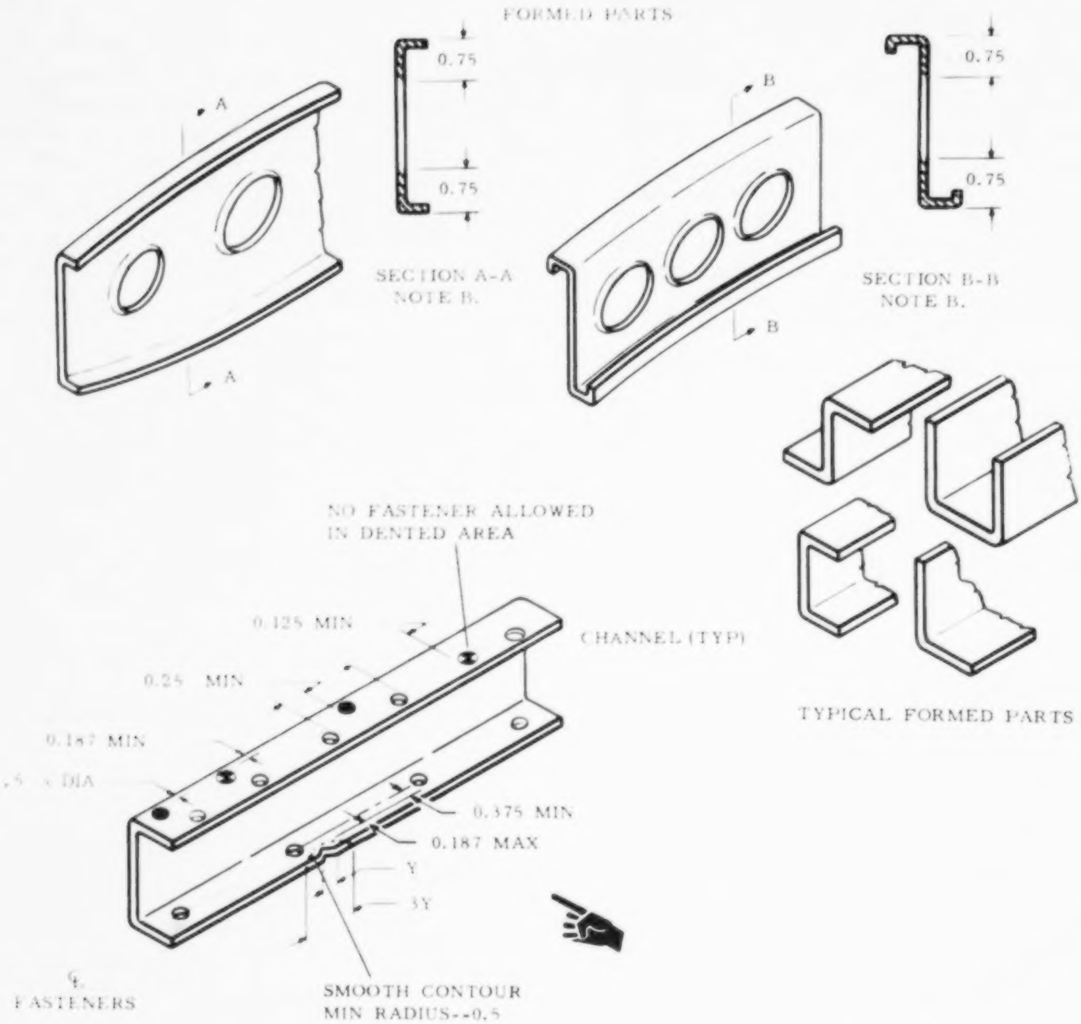
Stringers are formed or extruded sections riveted longitudinally to the side, bottom and crown panels of the structure. See fig. FO-2 for stringer identification.

2-25. *Inspection.*

Following inspection, damage to stringers should be classified as negligible, reparable, or necessitating replacement.

2-26. *Negligible Damage.* Examples of negligible damages to formed stringers are shown in fig. 2-3. Examples of negligible damage to extruded stringers are shown in fig. 2-8.

Damage which can be permitted to exist as is, or can be corrected by a simple procedure, such as removing dents and small damaged areas, stop-drilling cracks, and the plugging of small holes is permissible. Nicks, scratches, and small damaged areas can be removed by burnishing, provided the dimensions shown in fig. 2-8 are adhered to. The depth, after burnishing, must not be greater than 10 percent of the thickness of the thinnest leg of the extrusion. Punctures, rough dents, cracks, and nicks and scratches, which exceed the maximum burnished depth, are negligible only if they can be cleaned out as a round hole which can be classified as negligible. Plug all negligible damage holes $\frac{3}{16}$-inch diameter or over with a tight-fitting rivet or


FORMED PARTS
A
A
0.75
0.75
SECTION A-A
NOTE B.
B
B
0.75
0.75
SECTION B-B
NOTE B.
TYPICAL FORMED PARTS
NO FASTENER ALLOWED
IN DENTED AREA
0.125 MIN
CHANNEL (TYP)
0.25 MIN
0.187 MIN
1.5 x DIA
0.375 MIN
0.187 MAX
Y
3Y
℄
FASTENERS
SMOOTH CONTOUR
MIN RADIUS--0.5

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. DAMAGE IN SHADED AREAS AND OVERLAPPING SHADED AND UNSHADED AREAS IS CLASSIFIED AS NEGLIGIBLE OR NOT NEGLIGIBLE ACCORDING TO DIMENSIONS FOR GIVEN CHANNELS. DAMAGE IN UNSHADED AREAS MAY BE CLASSIFIED AS NEGLIGIBLE WHEN THE MAXIMUM DIAMETER OF HOLES IS 0.875 WITH THE DISTANCE BETWEEN TRIMMED EDGES OF ANY TWO HOLES BEING 10 TIMES THE DIAMETER OF LARGER HOLE

SYMBOLS

○ --ATTACHMENT HOLE
● --0.3125 MAX DIA HOLE.
⧗ --DENT.

42x51

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Figure 2-3. Negligible Damage Examples (Sheet 2 of 2)

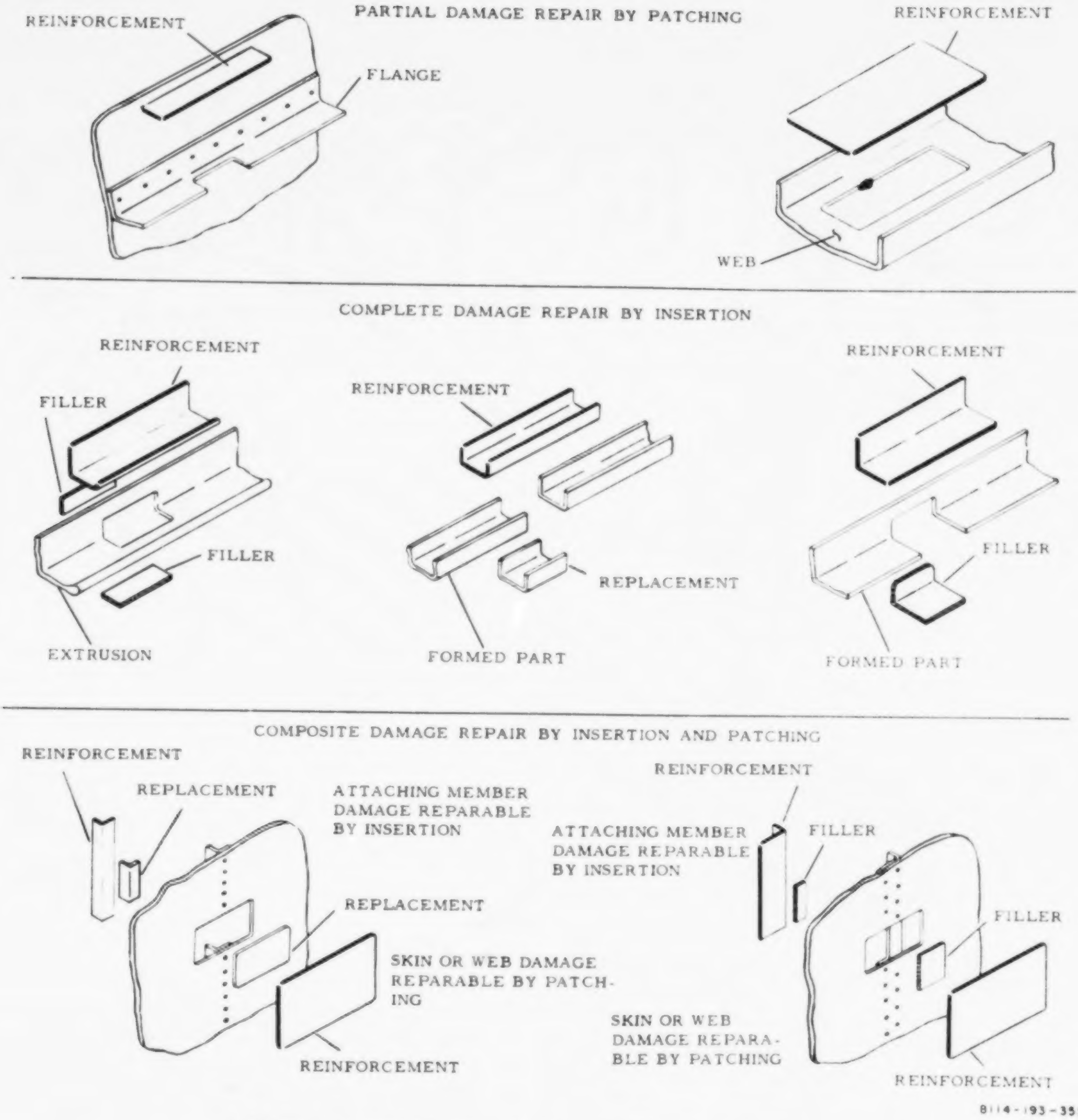

PARTIAL DAMAGE REPAIR BY PATCHING
REINFORCEMENT
FLANGE
REINFORCEMENT
WEB
COMPLETE DAMAGE REPAIR BY INSERTION
REINFORCEMENT
FILLER
FILLER
EXTRUSION
REINFORCEMENT
REPLACEMENT
FORMED PART
REINFORCEMENT
FILLER
FORMED PART
COMPOSITE DAMAGE REPAIR BY INSERTION AND PATCHING
REINFORCEMENT
REPLACEMENT
ATTACHING MEMBER DAMAGE REPARABLE BY INSERTION
REPLACEMENT
SKIN OR WEB DAMAGE REPARABLE BY PATCHING
REINFORCEMENT
REINFORCEMENT
ATTACHING MEMBER DAMAGE REPARABLE BY INSERTION
FILLER
FILLER
SKIN OR WEB DAMAGE REPARABLE BY PATCHING
REINFORCEMENT
8114-193-355

Figure 2-4. Classification of Damage and Types of Repair

bolt. Holes, plugged or open, and burnished areas, must clear all radiuses, and must clear all fasteners a minimum of ¾ inch. Smooth dents not exceeding the maximum burnished depth and a maximum of ½-inch diameter are negligible. Two adjacent dents to be classified as negligible must be separated by a 4-inch length of undamaged original extrusion. Measure the distance at the edges of the burnished areas. Apply two coats of zinc chromate primer (C259) to burnished areas and edges of holes.

CAUTION

The use of heat to remove a dent is not permitted. Heat can alter properties of the original part.

2-27. Reparable Damage (AVIM). Damage more extensive than that classified as negligible that does not affect more than one-half of the widest flange of a formed stringer can be repaired by patching. Damage to formed stringers affecting more than one-half the widest flange or extending into the radius should be repaired by insertion. The insertion of a partial replacement can be made, provided that the material and sectional dimensions referenced in TM55-1500-204-25/1 are used. Refer to para 2-619 for information on protective measures where dissimilar metals are used.

2-28. Damage Necessitating Replacement (AVIM). Extensive damage, such as the loss of a major portion of a stringer or numerous isolated damages, necessitates replacement of the stringer.

2-29. Formers.

The formers are members spaced at intervals thru the fuselage assemblies, the cargo loading ramp assembly and the aft pylon. Depending on location and function, the formers are designated as partial, full, crown, floor or bottom formers. The formers provide structural reinforcement in a crosswise (transverse) direction and also serve as the attaching points for the stringers, boundary members for major skin splices, and as a base for structural fittings. The following illustrations provide detailed information on the formers.

Fig. 2-9 Cockpit Fuselage Structure Assembly
(FO-3) Cabin Fuselage Structure Assembly
Fig. 2-10 Pod Installation Cabin Fuselage Structure
Fig. 2-11 Aft Fuselage Structure Assembly
Fig. 2-12 Cargo Loading Ramp Assembly
Fig. 2-13 Aft Pylon Structure Assembly

2-30. Inspection.

Following inspection, damage to formers should be classified as negligible, reparable, or necessitating replacement.

2-31. Negligible Damage. Damage which can be permitted to exist as is, or can be corrected by a simple procedure, such as burnishing nicks and scratches and removal of small damaged areas is considered negligible. Damage must clear bolts, rivets, and radiuses a minimum of ¾ inch. Damage to fittings is limited to burnishing which will not reduce area thickness more than 10 percent. Certain splice attachment hardware holes may be 0.015 inch oversize. See fig. 2-3 for examples of damage to the internal webs. See fig. 2-8 for examples of damage to the extruded parts.

2-32. Reparable Damage (AVIM). Damage more extensive than that classified as negligible but not exceeding one-half the web cross section can be repaired by patching. Damage that exceeds more than one-half of the web cross section or removes the heel of any extruded section should

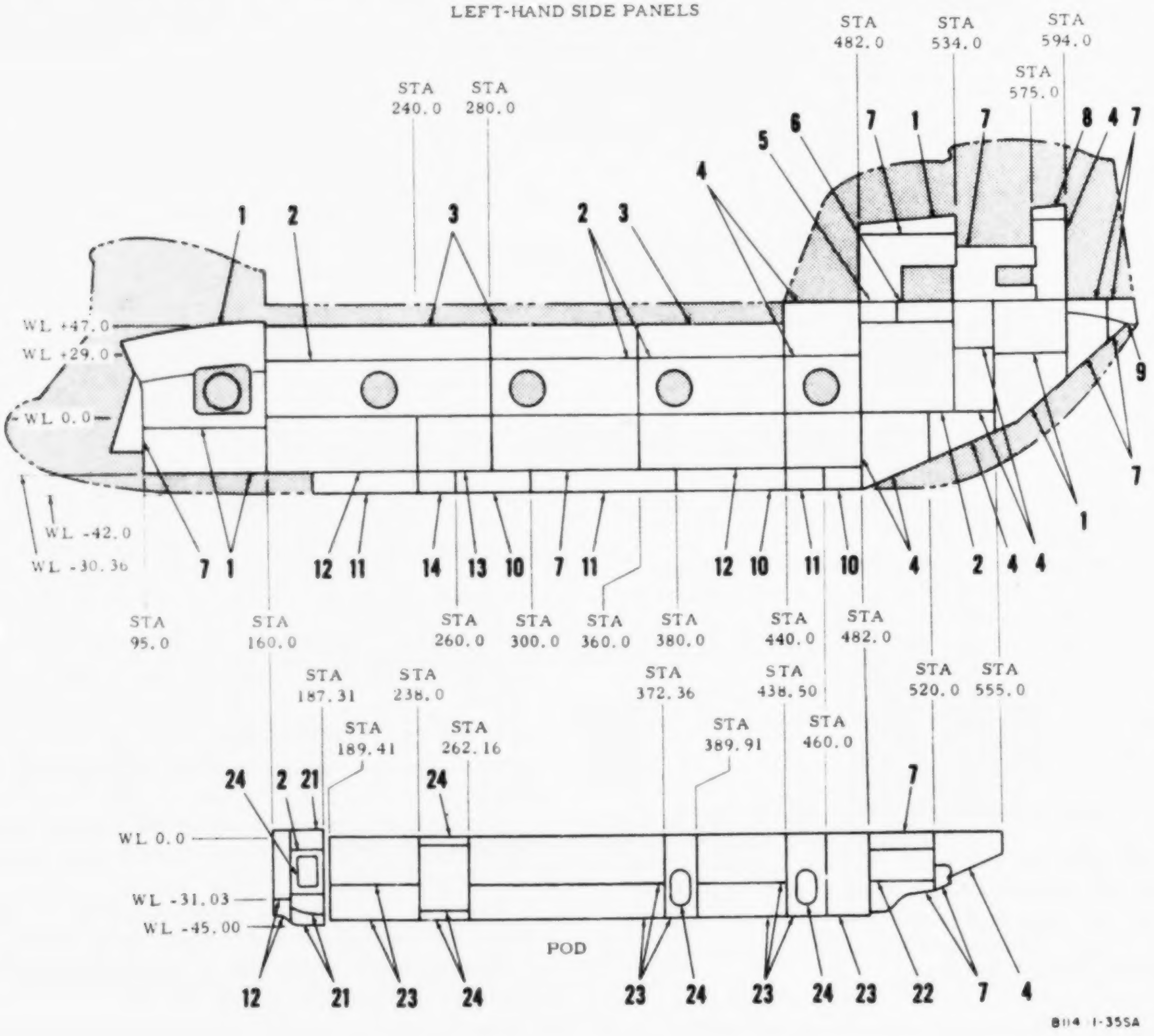

LEFT-HAND SIDE PANELS
STA 240.0
STA 280.0
STA 482.0
STA 534.0
STA 594.0
STA 575.0
1
2
3
2
3
4
5
6
7
1
7
8
4
7
9
7
1
WL +47.0
WL +29.0
WL 0.0
WL -42.0
WL -30.36
7
1
12
11
14
13
10
7
11
12
10
11
10
4
2
4
4
STA 95.0
STA 160.0
STA 260.0
STA 300.0
STA 360.0
STA 380.0
STA 440.0
STA 482.0
STA 187.31
STA 238.0
STA 372.36
STA 438.50
STA 520.0
STA 555.0
STA 189.41
STA 262.16
STA 389.91
STA 460.0
24
2
21
24
7
WL 0.0
WL -31.03
WL -45.00
POD
12
21
23
24
23
24
23
24
23
22
7
4
B114 1-355A

Figure 2-5. Body Skin Repairs (Sheet 1 of 4)

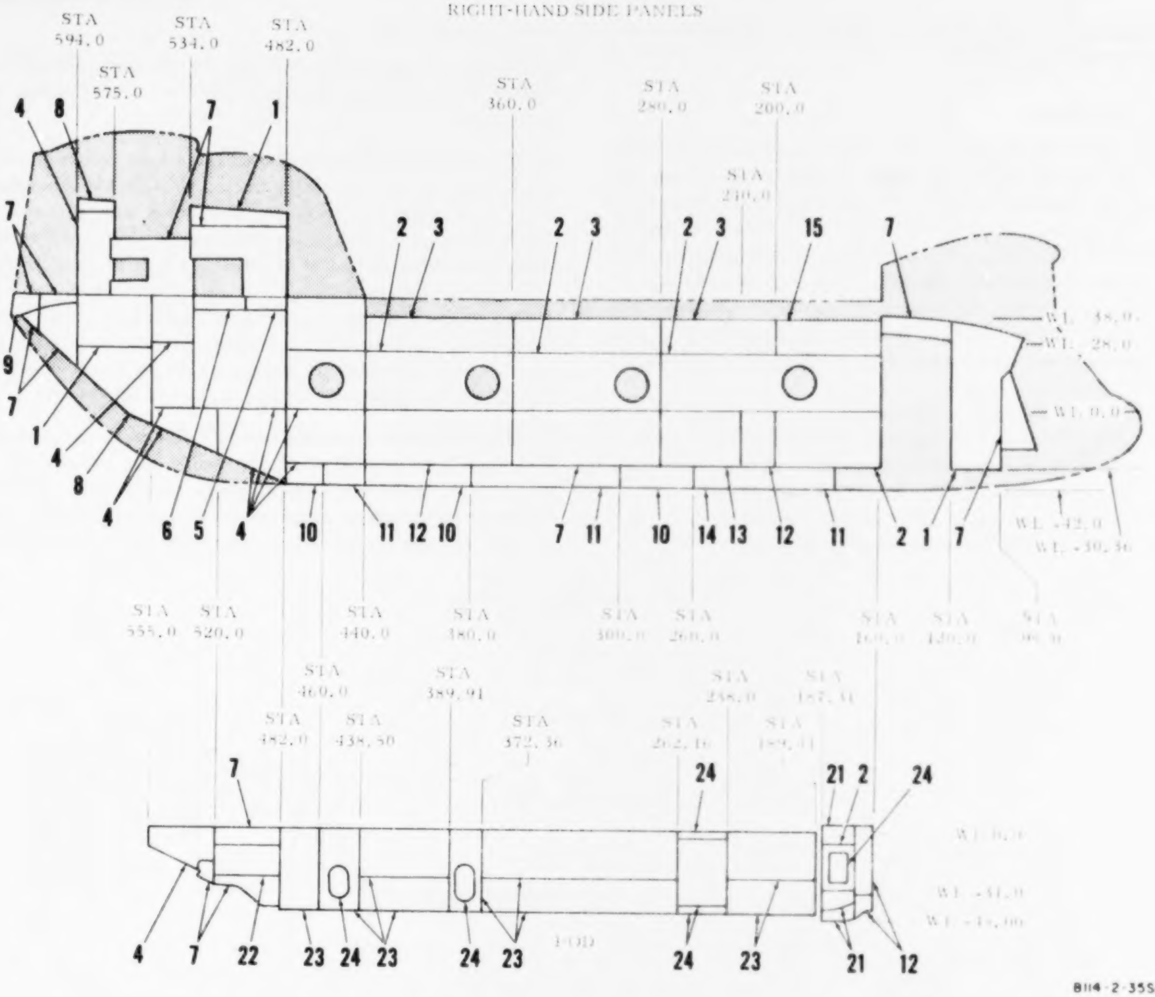

RIGHT-HAND SIDE PANELS
STA 594.0
STA 534.0
STA 482.0
STA 575.0
STA 360.0
STA 280.0
STA 200.0
STA 240.0
4
8
7
1
7
9
7
1
4
8
4
6
5
4
2
3
2
3
2
3
15
7
W.L. 38.0
W.L. 28.0
W.L. 0.0
10
11
12
10
7
11
10
14
13
12
11
2
1
7
W.L. -42.0
W.L. -30.36
STA 555.0
STA 520.0
STA 440.0
STA 380.0
STA 300.0
STA 260.0
STA 460.0
STA 389.91
STA 258.0
STA 482.0
STA 438.50
STA 372.36
STA 262.16
7
24
21
2
24
W.L. 0.0
4
7
22
23
24
23
24
23
24
23
21
12
FOD
B114-2-355A

Figure 2-5. Body Skin Repairs (Sheet 2 of 4)

be repaired by insertion. Refer to para 2-583 for damage classifications of extruded parts.

2-33. Damage Necessitating Replacement (AVIM). Extensive damage, such as the loss of a major portion of the former or numerous isolated damages, necessitates replacement in whole or in part. Damage to fittings joining the bottom sections to the side sections necessitates replacement of the bottom (bonded assembly) section. Damaged fittings, clips and small brackets or supports require replacement.

2-33.1. Bellcrank Support Fitting Former Repair, Sta 482. (See fig. 2-5.1.) The former at 482 can develop cracks near the upper left web, where the flight control rigid link passes and connects to the aft actuator (114H6600). Inspect the damage, then determine if the cracks are reparable. Refer to para 2-27 thru 2-33 and fig. 2-11 (sheet 5 of 21). If reparable, proceed as follows:

a. Apply hydraulic power to the flight control hydraulic system. (Refer to para 1-97.)

NOTE

Static loads must be removed from the control system to permit removal of installation hardware.

b. Position flight controls in NEUTRAL.

c. Install safety blocks on forward and aft upper boost actuators.

d. Shut down hydraulic power.

e. Open the upper and lower pylon leading edge fairings.

f. Remove both connecting links, the walking beam bellcrank, and the forward and aft bellcrank support. (Refer to para 11-269 and 11-270.)

g. Drill out existing rivets with a No. 11 (0.191 inch dia) drill; then remove the doubler web. (See fig. 2-5.1.)

h. Drill stop holes at the ends of cracks using a No. 41 (0.096) inch diameter drill. (See fig. 2-5.1.)

i. Fabricate a new doubler web from material .090301 CRES .25 HARD QQ-S-766 and filler material 050

ALAL2024-T3 QQ-A-250/5 to cover 3 inches around the existing hole. See fig. 2-5.1, sheet 2.

j. Install the new filler and doubler web at the forward side of frame 482.

k. Drill 20 new rivet holes in the new doubler web and leg of the stiffener using a No. 11 (0.191 inch) drill. (See fig. 2-5.1.)

l. Drill seven new rivet holes in the (0.88 inch) flange bend area of the new doubler web and leg of the stiffener. Use a No. 11 (0.191 inch dia) drill.

m. Countersink three holes at 100° under support assembly 114S3383 series.

n. Remove the new doubler web and filler; then deburr as required.

o. Prime the parts with zinc chromate primer (C259). (Refer to para 2-620.)

p. Install the new doubler web and filler; then deburr as required.

q. Install the connecting link, walking beam bellcrank, lower pylon bellcrank, and forward and aft bellcrank fittings. (Refer to para 11-270.)

r. Remove the safety blocks from forward and aft upper boost actuators. (Refer to para 11-54, step c.)

s. Perform a neutral rig check of aft flight control system. (Refer to para 11-74.)

2-33.2. Repair of Aft Crown Cap at Sta 534.0. (See fig. 2-5.2.) The former at sta 534 can develop cracks in the area of the cap on each side of the former. Inspect the damage, then determine if the cracks are repairable. Refer to para 2-27 thru 2-33 and fig. 2-11 (sheets 12 thru 15). If repairable, proceed as follows:

a. Remove equipment, tubing, and hydraulic hoses as necessary to gain access to repair area.

b. Drill out and remove fasteners at base of sta 534.0 frame as necessary to peel back web (1).

c. Cut support bow tie (13) at sta 534.0, wl 57, bl 0. Protect the No. 9 drive shaft to prevent damage during the cutting operation. Ensure that the sta 534.0 web is not cut.

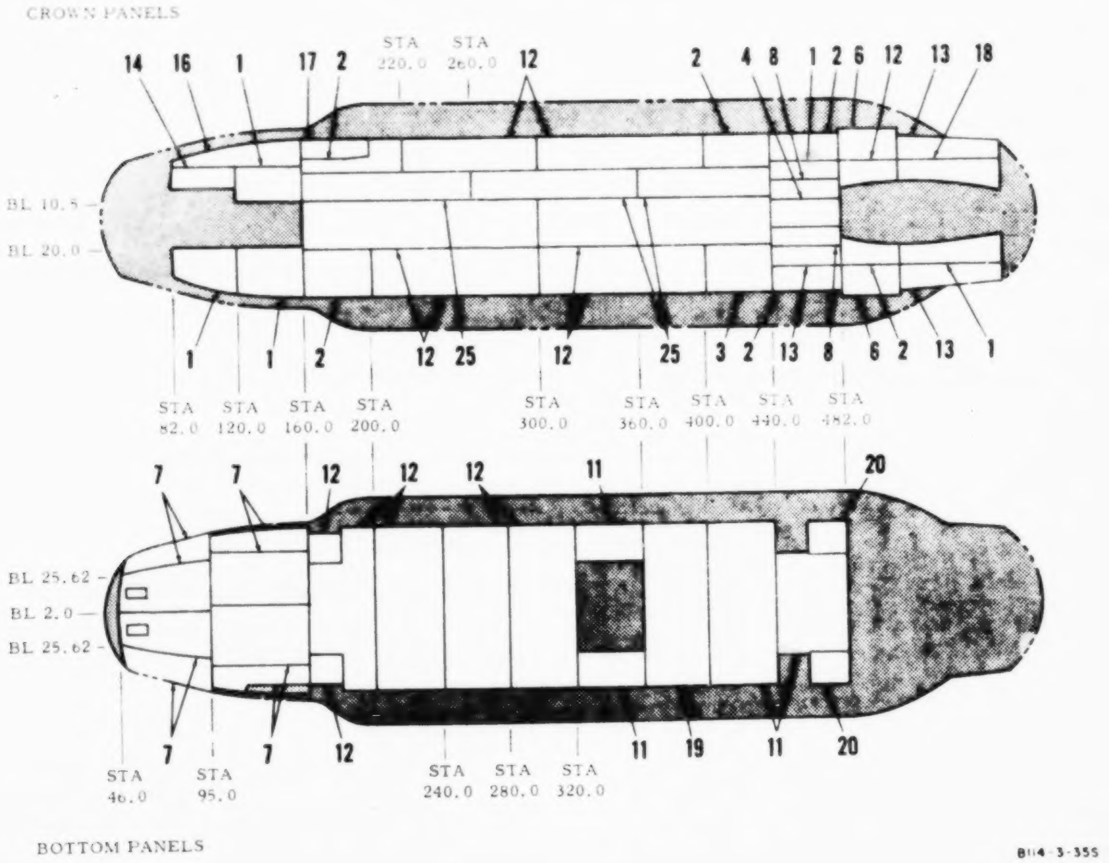

CROWN PANELS
STA 220.0
STA 260.0
14
16
1
17
2
12
2
4
8
1
2
6
12
13
18
BL 10.5
BL 20.0
1
1
2
12
25
12
25
3
2
13
8
6
2
13
1
STA 82.0
STA 120.0
STA 160.0
STA 200.0
STA 300.0
STA 360.0
STA 400.0
STA 440.0
STA 482.0
7
7
12
12
12
11
20
BL 25.62
BL 2.0
BL 25.62
7
7
12
11
19
11
20
STA 46.0
STA 95.0
STA 240.0
STA 280.0
STA 320.0
BOTTOM PANELS
B114-3-355

Figure 2-5. Body Skin Repairs (Sheet 3 of 4)

LEFT-HAND SIDE, RIGHT-HAND SIDE, CROWN, AND BOTTOM BODY SKIN PANELS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	SKIN PANEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
2	SKIN PANEL	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD	2-7
3 △	SKIN PANEL	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
▢	SKIN PANEL	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD	2-7
4	SKIN PANEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
5	SHELF	0.032 321 (OR 347) ANL CRES	0.040 321 (OR 347) ANL CRES	2-7
6	SKIN PANEL	0.020 301 ANL CRES	0.025 301 ANL CRES	2-7
7	SKIN PANEL	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
8	SKIN PANEL	0.063 2024-T4 CLAD	0.063 2024-T4 CLAD	2-7
9	TRAILING EDGE CLOSURE PANEL	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD	2-7
10	SKIN PANEL	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	2-7
11	SKIN PANEL	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
12	SKIN PANEL	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD	2-7
13	SKIN PANEL	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
14	SKIN PANEL	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	2-7
15	SKIN PANEL	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	2-7
16	SKIN PANEL	0.071 2024-T4 CLAD	0.071 2024-T3 CLAD	2-7
17	SKIN PANEL	0.070 2024-T4 CLAD	0.070 2024-T3 CLAD	2-7
18	SKIN PANEL	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	2-7
19	SKIN PANEL	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD	2-7
20	SKIN PANEL	0.063 7075-T6 CLAD	0.063 7075-T6 CLAD	2-7
21	SKIN PANEL	0.020 2024-T3 CLAD	0.025 2024-T3 CLAD	2-7
22	SKIN PANEL	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
23	PANEL	REFER TO NOTE E.	--	--
24	ACCESS PANEL	REFER TO NOTE F.	--	--
25	WALKWAY	REFER TO NOTE G.	--	--

△ USED ON HELICOPTERS, 66-19098 THROUGH 67-18445
▢ USED ON HELICOPTERS, 67-18446 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. STATIONS AND WATERLINES REPRESENT THE CENTERLINE OF SKIN PANEL JOINTS
C. REFER TO PARA 2-635 FOR INFORMATION ON OILCAN INSPECTION AND REPAIR AND TO PARA 2-511 FOR INFORMATION ON WATERTIGHT SEALING
D. SEE FIG. 2-6 FOR NEGLIGIBLE DAMAGE TO SKIN PANELS
E. THE PANELS (23) ARE SANDWICH HONEYCOMB STRUCTURES. REFER TO PARA 2-631 FOR REPAIR INFORMATION
F. SEE FIG. 2-64 (SHEETS 8 & 9) FOR INFORMATION ON REPAIR OF ACCESS DOORS AND PANELS
G. THE CABIN CROWN WALKWAYS (25) ARE SANDWICH HONEYCOMB STRUCTURES. REFER TO PARA 2-224

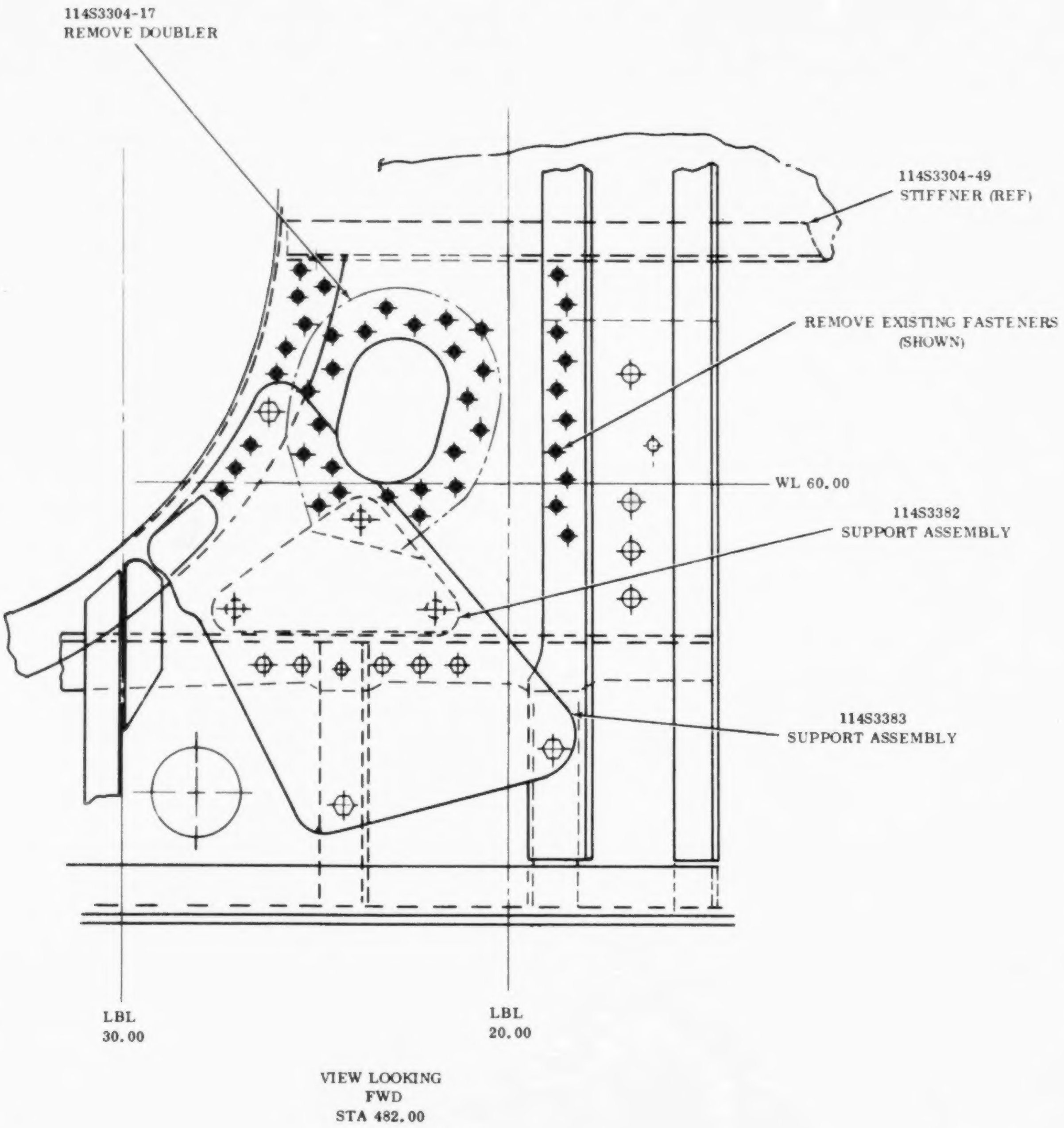
42x51

B114-76-345V

Figure 2-5. Body Skin Repairs (Sheet 4 of 4)

FASTENER LEGEND

SYMBOL	FASTENER
◆	REMOVE EXISTING RIVETS

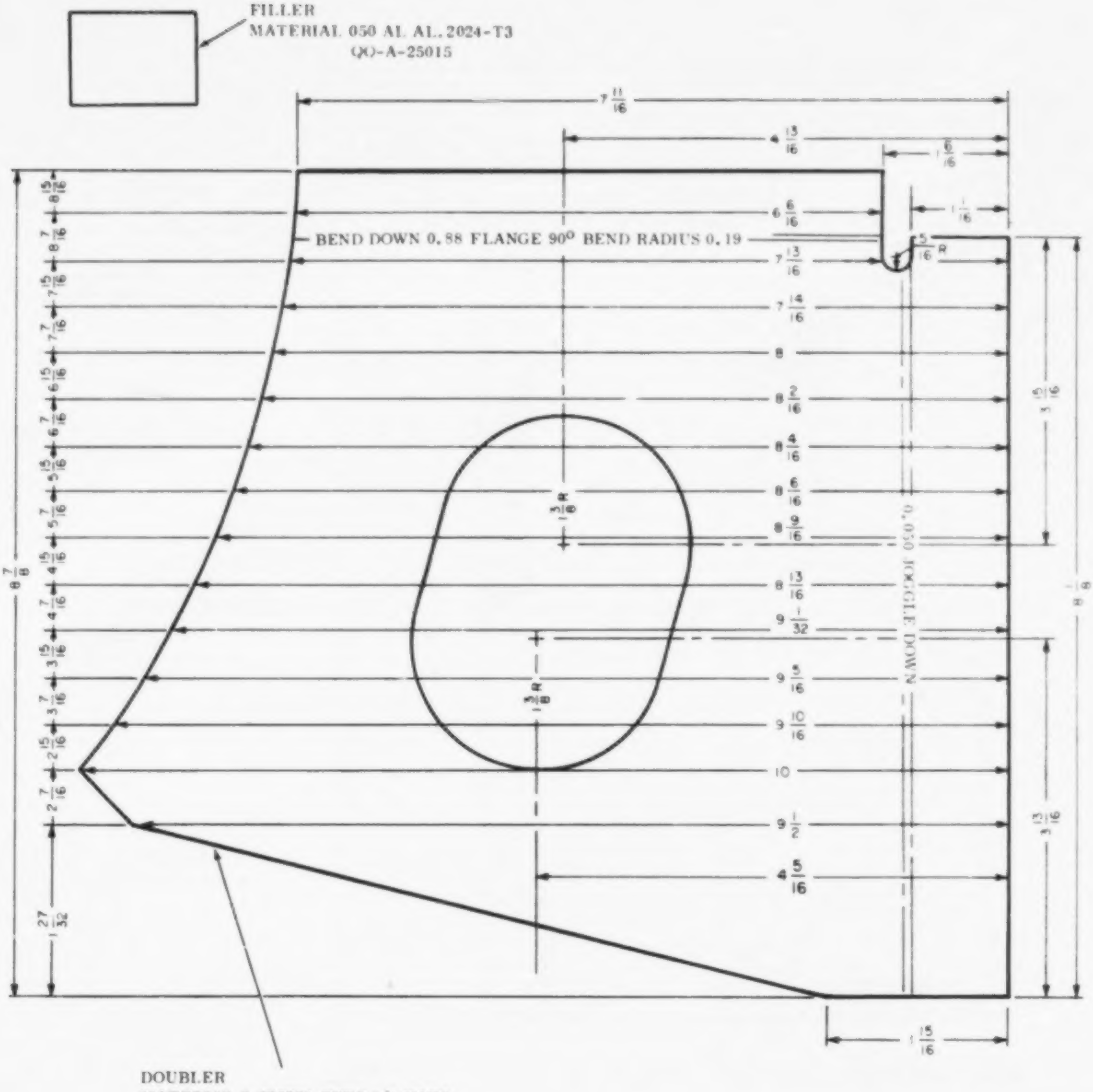

114S3304-17
REMOVE DOUBLER
114S3304-49
STIFFNER (REF)
REMOVE EXISTING FASTENERS
(SHOWN)
WL 60.00
114S3382
SUPPORT ASSEMBLY
114S3383
SUPPORT ASSEMBLY
LBL
30.00
LBL
20.00
VIEW LOOKING
FWD
STA 482.00

39x51

B114-101-23

Figure 2-5.1. Former Repair Bellcrank Support Fitting, Sta 482 (Sheet 1 of 4)

SERVICE NOTE 114-0571


FILLER
MATERIAL 050 AL AL. 2024-T3
QQ-A-25015
7 11/16
4 13/16
1 6/16
6 6/16
1 1/16
BEND DOWN 0.88 FLANGE 90° BEND RADIUS 0.19
5/16 R
7 13/16
7 14/16
8
8 2/16
8 4/16
8 6/16
8 9/16
8 13/16
9 1/32
9 5/16
9 10/16
10
9 1/2
4 5/16
1 15/16
3/8 R
3/8 R
0.050 JOGGLE DOWN
3 15/16
8 1/8
3 13/16
8 15/16
8 7/16
7 15/16
7 7/16
6 15/16
6 7/16
5 15/16
5 7/16
4 15/16
4 7/16
3 15/16
3 7/16
2 15/16
2 7/16
8 7/8
1 27/32
DOUBLER
MATERIAL 0.090301 CRES 1/4 HARD
QQ-S-766

42 X 41

8114-100-23

Figure 2-5.1. Former Repair, Bellcrank Support Fitting, Sta 482 (Sheet 2 of 4)

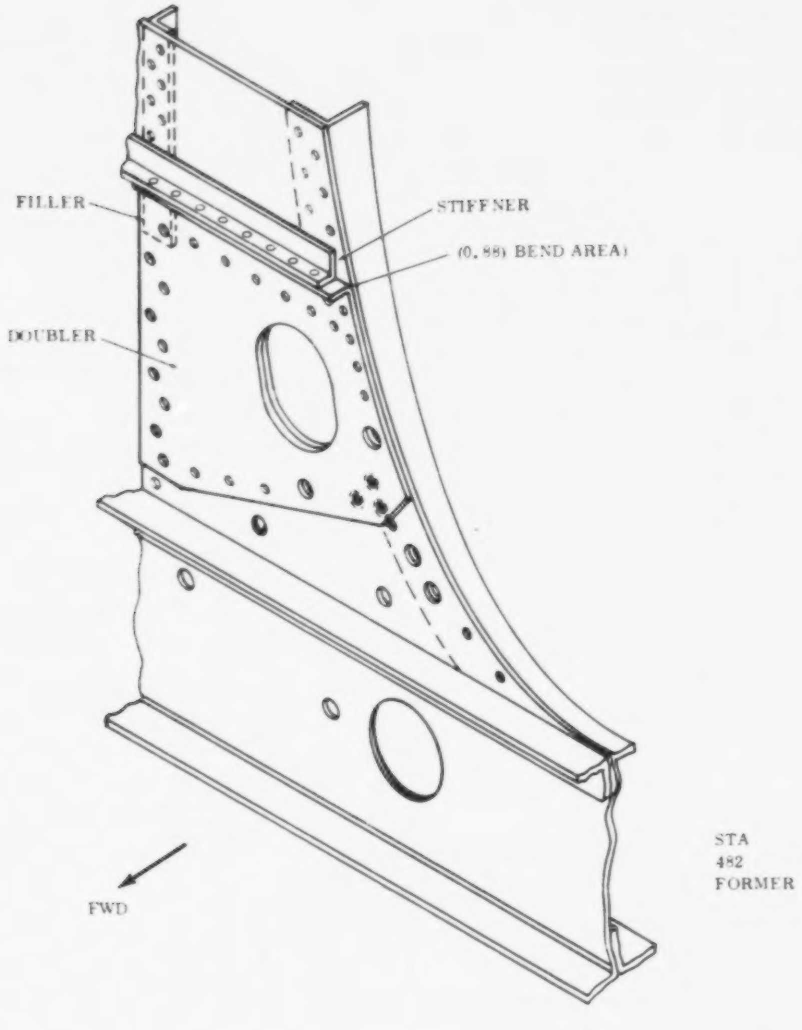
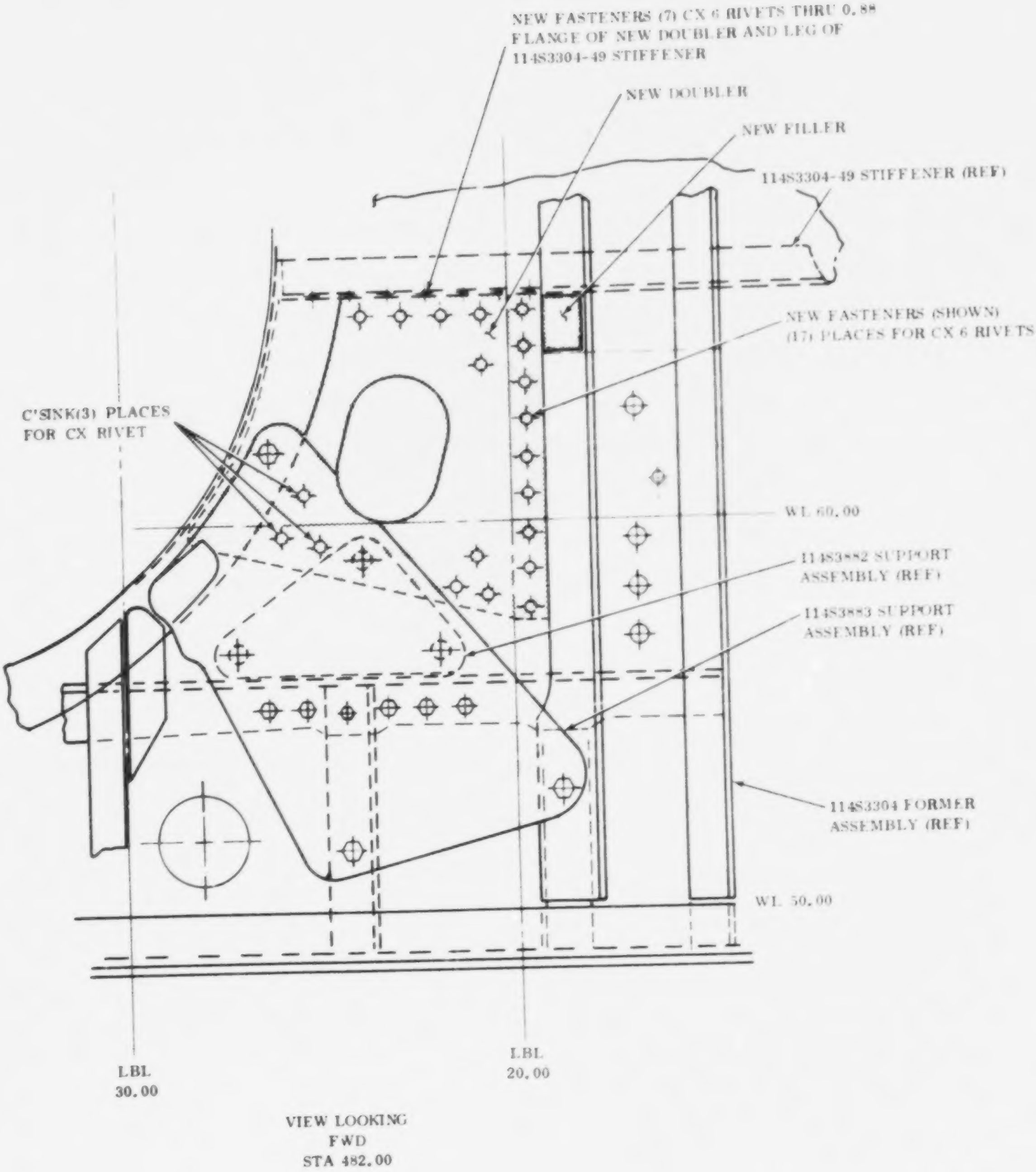

FILLER
STIFFNER
(0.88) BEND AREA)
DOUBLER
STA
482
FORMER
FWD
B114-102-23

Figure 2-5.1. Former Repair Bellcrank Support Fitting, Sta 482 (Sheet 3 of 4)

FASTENER LEGEND

SYMBOL	PART NO.	FASTENER
⌖	MS20470DD6	RIVET


NEW FASTENERS (7) CX 6 RIVETS THRU 0.88 FLANGE OF NEW DOUBLER AND LEG OF 114S3304-49 STIFFENER
NEW DOUBLER
NEW FILLER
114S3304-49 STIFFENER (REF)
NEW FASTENERS (SHOWN) (17) PLACES FOR CX 6 RIVETS
C'SINK(3) PLACES FOR CX RIVET
WL 60.00
114S3882 SUPPORT ASSEMBLY (REF)
114S3883 SUPPORT ASSEMBLY (REF)
114S3304 FORMER ASSEMBLY (REF)
WL 50.00
LBL 30.00
LBL 20.00
VIEW LOOKING FWD STA 482.00

39151

B114-103-23

Figure 2-5.1. Former Repair Bellcrank Support Fitting. Sta 482 (Sheet 4 of 4)

FASTENERS AND RIVET LEGEND
●BACR15DN6D
○BACR15DN4AD
◒BACR15DN5AD
▼NAS1466-6 AND NAS1080-06
▽NAS1466-5 AND NAS1080-06
⧩NAS1466-4 AND NAS1080-06
⊕NAS1466-13 AND NAS1080-06
■NAS1468-4 AND NAS1080-06
⬒M7885/4-5-7
◪BACB30MB5-7 AND BACC30X5
□BACB30MB5-6 AND BACC30X5

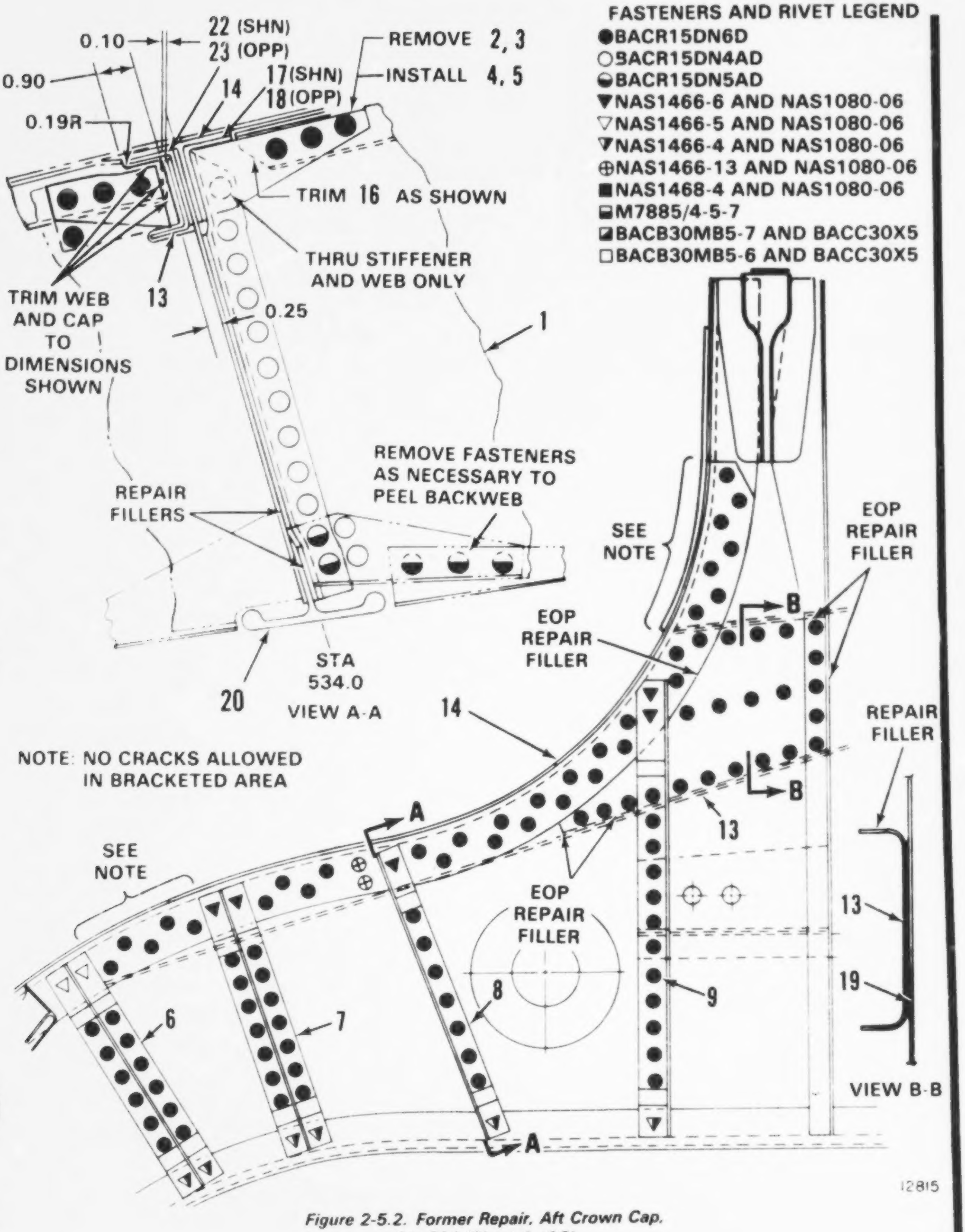

0.10
22 (SHN)
23 (OPP)
REMOVE 2, 3
0.90
17(SHN)
INSTALL 4, 5
14
18(OPP)
0.19R
TRIM 16 AS SHOWN
THRU STIFFENER
AND WEB ONLY
TRIM WEB
AND CAP
TO
DIMENSIONS
SHOWN
13
0.25
1
REMOVE FASTENERS
AS NECESSARY TO
PEEL BACKWEB
REPAIR
FILLERS
SEE
NOTE
EOP
REPAIR
FILLER
B
EOP
REPAIR
FILLER
20
STA
534.0
VIEW A-A
14
REPAIR
FILLER
NOTE: NO CRACKS ALLOWED
IN BRACKETED AREA
B
13
A
SEE
NOTE
EOP
REPAIR
FILLER
13
19
6
7
8
9
VIEW B-B
A
12815

Figure 2-5.2. Former Repair, Aft Crown Cap, Sta 534 (Sheet 1 of 3)

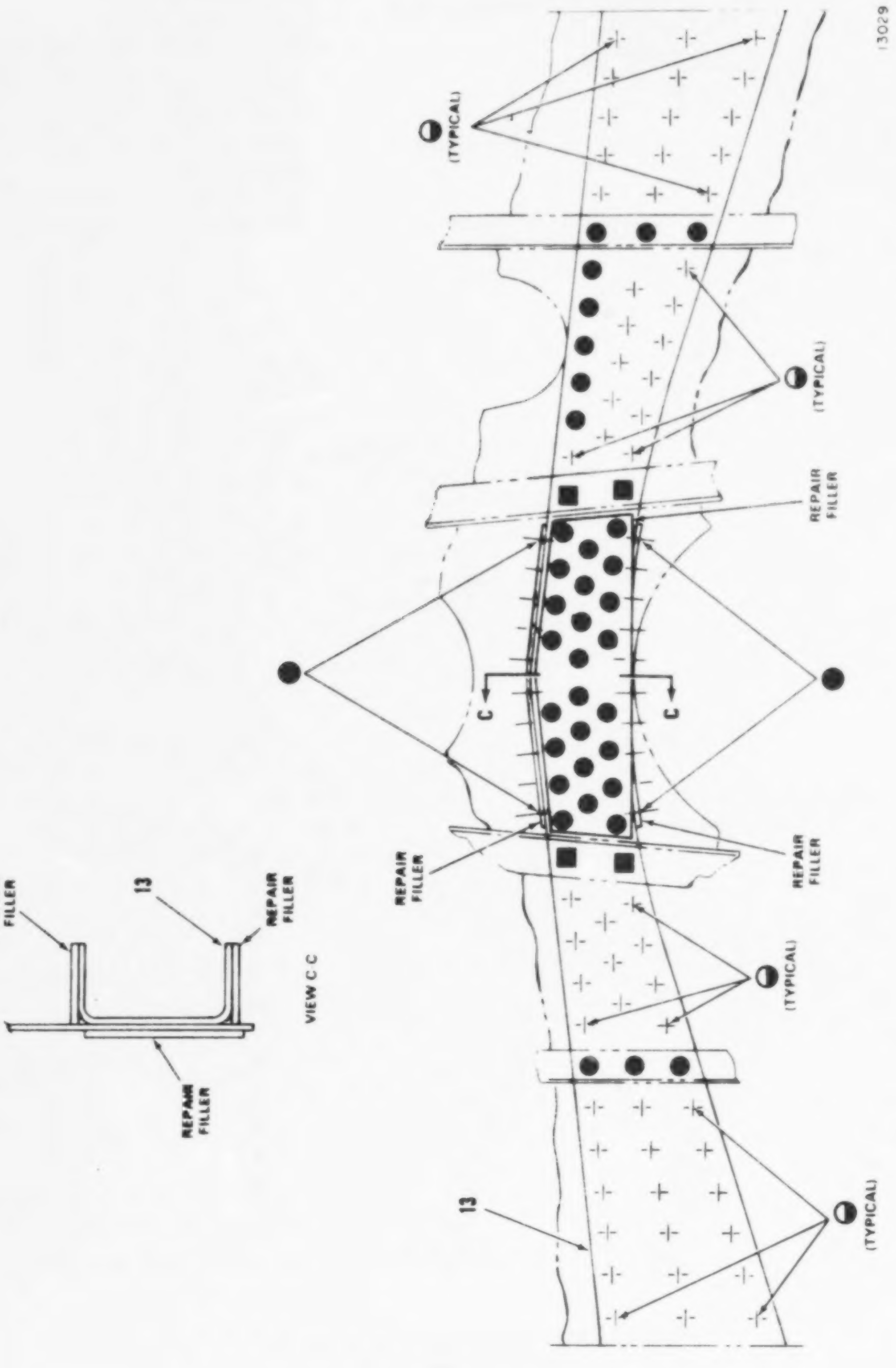
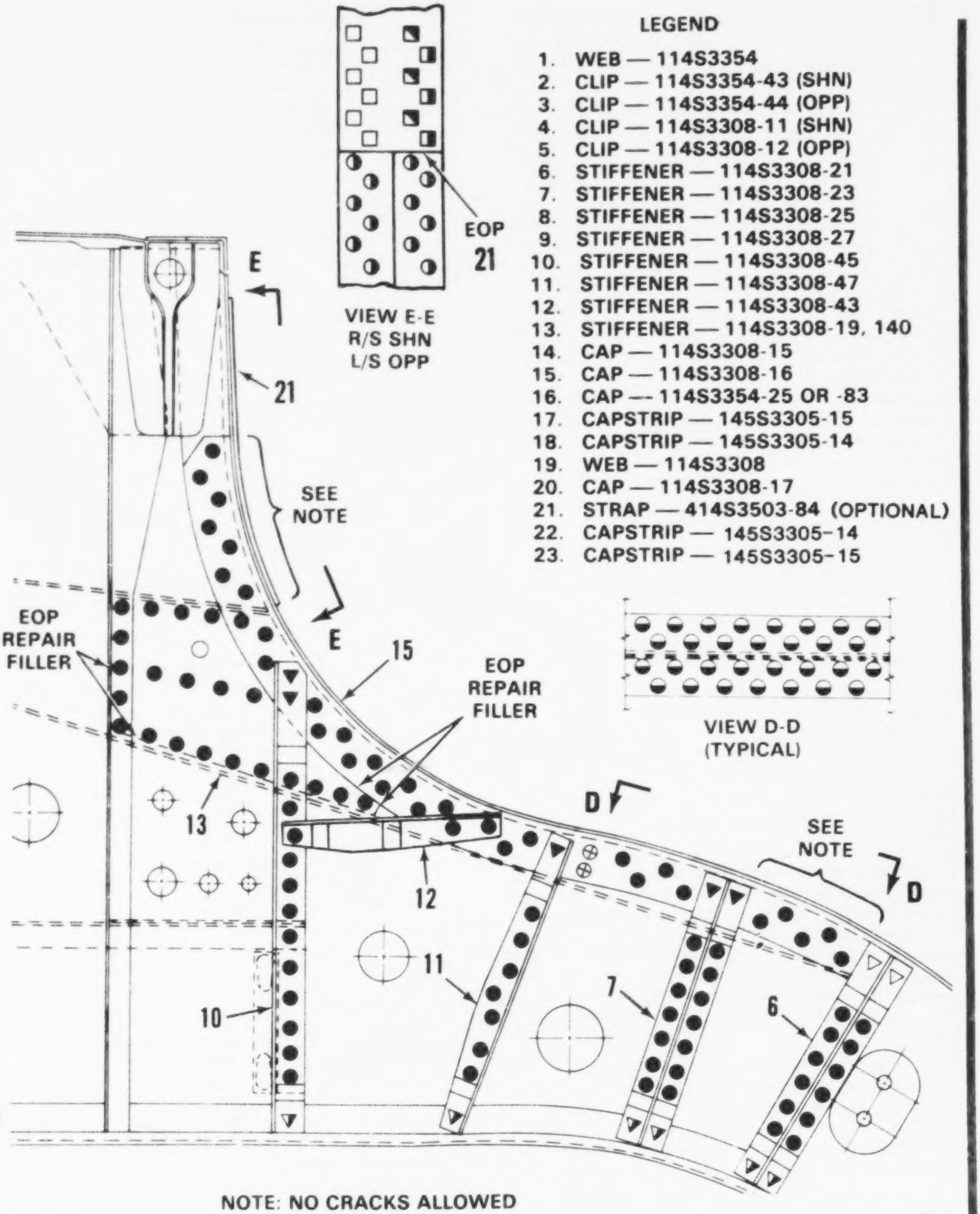

REPAIR FILLER
13
REPAIR FILLER
REPAIR FILLER
VIEW C-C
13
(TYPICAL)
(TYPICAL)
REPAIR FILLER
C
C
REPAIR FILLER
REPAIR FILLER
(TYPICAL)
(TYPICAL)
13029

Figure 2-5.2. Former Repair, Aft Crown Cap. Sta 534 (Sheet 2 of 3)

LEGEND

1. WEB — 114S3354
2. CLIP — 114S3354-43 (SHN)
3. CLIP — 114S3354-44 (OPP)
4. CLIP — 114S3308-11 (SHN)
5. CLIP — 114S3308-12 (OPP)
6. STIFFENER — 114S3308-21
7. STIFFENER — 114S3308-23
8. STIFFENER — 114S3308-25
9. STIFFENER — 114S3308-27
10. STIFFENER — 114S3308-45
11. STIFFENER — 114S3308-47
12. STIFFENER — 114S3308-43
13. STIFFENER — 114S3308-19, 140
14. CAP — 114S3308-15
15. CAP — 114S3308-16
16. CAP — 114S3354-25 OR -83
17. CAPSTRIP — 145S3305-15
18. CAPSTRIP — 145S3305-14
19. WEB — 114S3308
20. CAP — 114S3308-17
21. STRAP — 414S3503-84 (OPTIONAL)
22. CAPSTRIP — 145S3305-14
23. CAPSTRIP — 145S3305-15


EOP
21
VIEW E-E
R/S SHN
L/S OPP
E
21
SEE NOTE
E
EOP REPAIR FILLER
15
EOP REPAIR FILLER
13
12
D
SEE NOTE
D
VIEW D-D
(TYPICAL)
11
10
7
6
12816

NOTE: NO CRACKS ALLOWED
IN BRACKETED AREA

Figure 2-5.2. Former Repair, Aft Crown Cap, Sta 534 (Sheet 3 of 3)

d. Drill out and remove fasteners from clips (2 and 3). Discard clips (2 and 3).

e. Drill out and remove fasteners from stiffeners (6, 7, 8, 9, 10, 11, and 12).

f. Drill out and remove fasteners from T-caps (14 and 15) and from stiffener (13) where shown.

g. Stop drill any cracks found during inspection of T-caps (14 and 15).

h. Trim cap (16) at top of sta 534.0 frame as shown.

i. Position capstrips (17 and 18) on aft faces and capstrips (22 and 23) on forward faces of frame and nest against T-caps (14 and 15). Position straps (21) on outside of aircraft over T-caps. Transfer drill and cleco as required.

j. Reposition bow tie half and install with repair fillers fabricated from .050 2024T3 aluminum sheet (C56.3) as shown.

k. Fabricate repair fillers from .050 2024T3 aluminum sheet (C56.3) and position between stiffener (13) and web (19) on forward side of frame. Transfer drill and cleco as required.

l. Fabricate repair fillers from .050 2024T3 aluminum sheet (C56.3) and position between stiffeners (6, 7, 8, 9, 10, 11, and 12) and web (19) and cap (20). Transfer drill and cleco as required.

m. Install new clips (4 and 5) on aft face of frame where shown. Transfer drill and cleco as required.

n. Install fasteners and rivets as required.

2-34. Longerons.

The longerons are extruded aluminum alloy members variously located in the fuselage assemblies and are similar to stringers in function.

2-35. *Inspection.*

Following inspection, damage to longerons should be classified as negligible, reparable, or necessitating replacement.

2-36. Negligible Damage. Damage which can be corrected by a simple procedure, such as burnishing of nicks and scratches and removal of small damaged areas, is permissible. Burnished areas shall clear all bolts, rivets and radiuses a minimum of ¾ inch and shall not exceed a depth equal to 10 percent of material thickness. See fig 2-8 for examples of damage to the extruded sections and fig. 2-3 for examples of damage to the internal webs and formed parts.

2-37. Reparable Damage (AVIM). Refer to para 2-583 for damage classifications for extruded sections. Damage to the web affecting less than one-half of a web cross section can be repaired by patching. Damage to the web affecting more than one-half of a web cross section should be repaired by insertion.

2-38. Damage Necessitating Replacement (AVIM). Damage resulting in the loss of a major portion of a longeron or numerous isolated damages necessitate replacement.

2-39. Bulkhead—Station 95.

The bulkhead consists primarily of six webs: a crown web, extending the full width of the body across the crown and forming supporting structure for the forward transmission in conjunction with beams at bl 18; and five side webs, two on the rh side and three on the lh side. All of the webs are reinforced with formed and extruded caps. Formed stiffeners are riveted laterally to the webs.

2-40. *Inspection.*

Following inspection, damage to the bulkhead should be classified as negligible, reparable, or necessitating replacement.

2-41. Negligible Damage. Damage which can be corrected by a simple procedure, such as the burnishing of nicks and scratches and the removal of small damaged areas, is permissible. Burnished areas must not exceed a depth equal to 10 percent of material thickness. See fig. 2-3 and 2-8 for examples of damage to webs, formed parts, and extruded parts.

2-42. Reparable Damage (AVIM). (See fig 2-14.) Damage more extensive than negligible, affecting less than 25 percent of the cross section of a web, may be repaired by patching provided sufficient clearance is maintained from adjacent parts of proper rivet spacing. Damage which affects more than 25 percent of the cross section of a web, should be repaired by insertion. Refer to para 2-635 for information on oilcan inspection and repair.

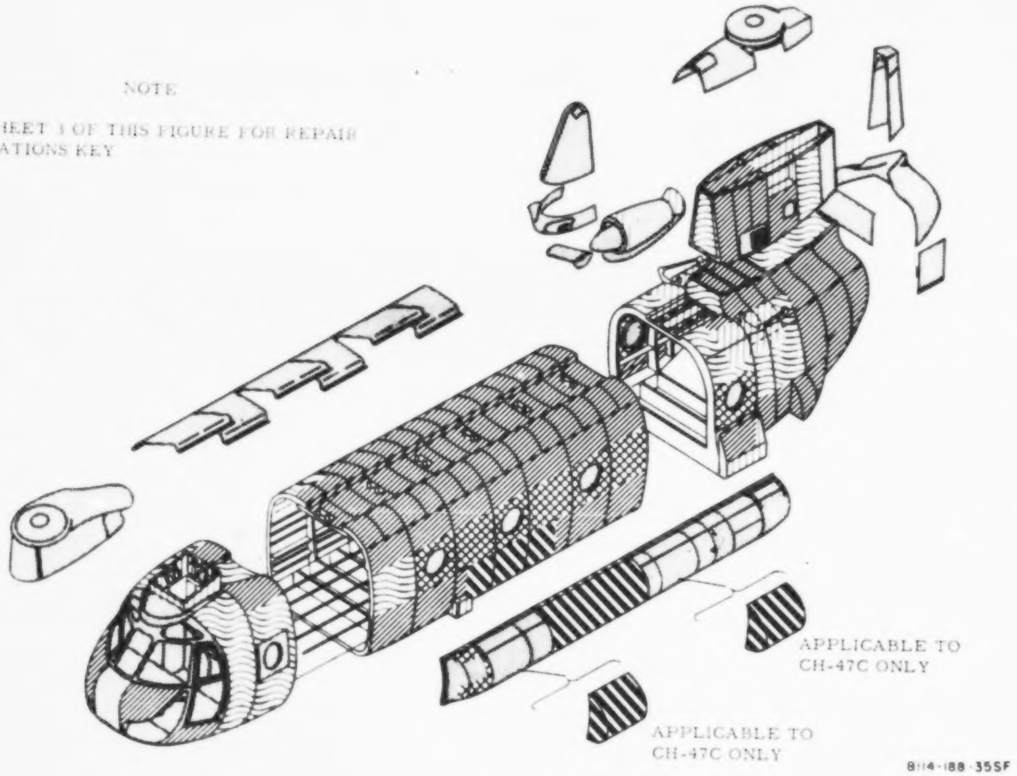
2-43. Damage Necessitating Replacement (AVIM). Extensive damage, such as the loss of a major portion of the length of a part or numerous isolated damages, necessitates replacement in whole or in part. Damage to fittings, other than negligible, necessitates replacement.

2-44. Beams.

The beams are made of aluminum alloy webs reinforced with formed and extruded stiffeners. Located in all the fuselage assemblies and the aft pylon structure assembly, the beams provide support for various components as follows:

a. In the cockpit fuselage structure assembly beams are located at bl 18 on each side of the center line between sta 95 and 120. Four beams, reinforced with extruded caps and stiffeners, are installed between sta 70.62 and 95, below the cockpit floor. Refer to fig. 2-15, sheets 1 and 2.

b. In the cabin fuselage structure assembly, the beams, (fig. 2-15, sheets 3 thru 17) include one beam on the crown panel, three beams on each side panel, and 11 beams on the bottom panel. The beam on the crown panel extends from sta 320 to 340 on the center line of the fuselage. The beams on each side panel are those at wl +29, 0 and -16. Those beams at wl +29 extend from sta 160 to 440 and support the troop seat backrests and litter poles. The beams at wl 0 extend the same distance. The beams at wl -16 extend from sta 140 to 482 and support the troop seats. The beams on the bottom panel are the cargo tiedown adapter beams, forward landing gear support beams, rescue hoist cutout

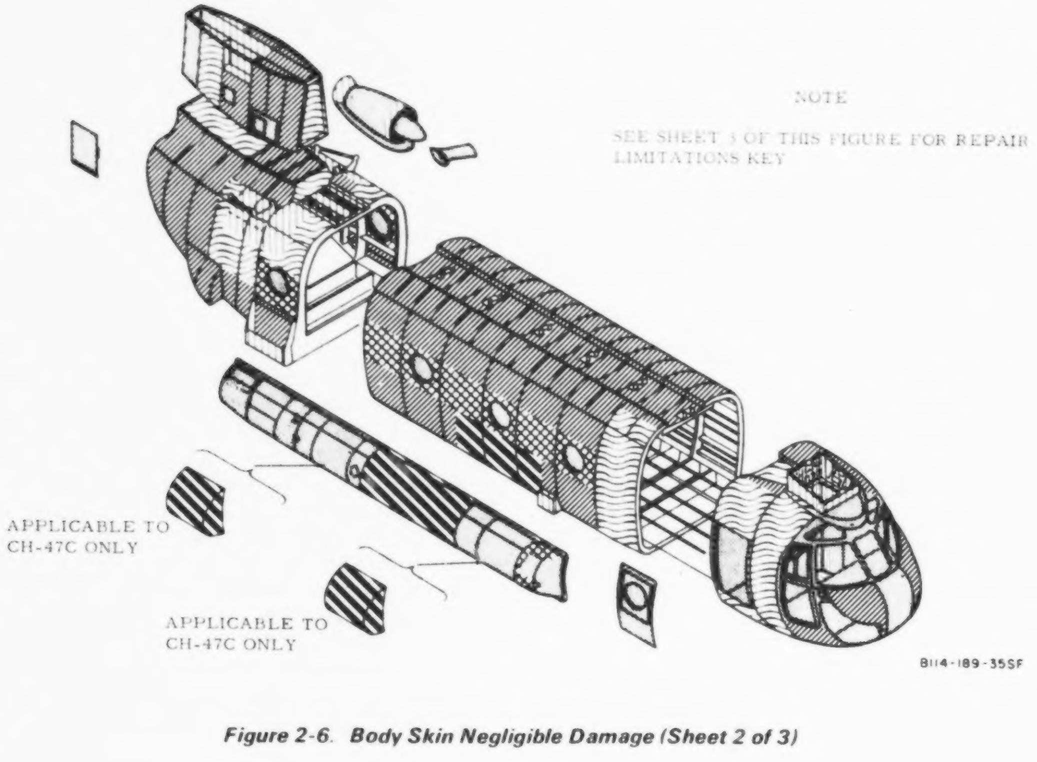


NOTE

SEE SHEET 3 OF THIS FIGURE FOR REPAIR LIMITATIONS KEY

APPLICABLE TO
CH-47C ONLY
APPLICABLE TO
CH-47C ONLY
B114-188-35SF

Figure 2-6. Body Skin Negligible Damage (Sheet 1 of 3)



NOTE

SEE SHEET 3 OF THIS FIGURE FOR REPAIR LIMITATIONS KEY

APPLICABLE TO
CH-47C ONLY
APPLICABLE TO
CH-47C ONLY
B114-189-35SF

Figure 2-6. Body Skin Negligible Damage (Sheet 2 of 3)

REPAIR LIMITATION KEY

▒ REFER TO NOTE B.

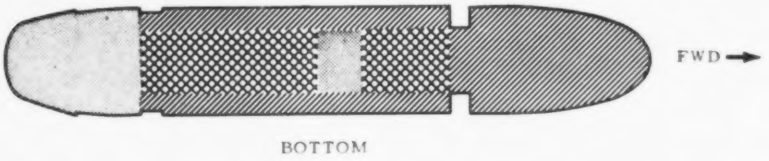
▩ REFER TO NOTE C.

▨ REFER TO NOTE D.

▧ REFER TO NOTE E.

≋ REFER TO NOTE F.

▥ REFER TO NOTE G.



NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. HOLES ARE ALLOWED IN THESE AREAS PROVIDING THE PART IS SECURELY ATTACHED TO THE HELICOPTER. THE PART SHOULD BE REMOVED IF POSITIVE SECURITY CANNOT BE ASCERTAINED

C. HOLES ARE ALLOWED IN THESE AREAS PROVIDING NO ONE HOLE EXCEEDS 3.0 DIAMETER AND THE MINIMUM DISTANCE BETWEEN ADJACENT HOLES IS TEN TIMES THE DIAMETER OF THE LARGEST HOLE

D. HOLES IN THESE AREAS MUST BE TRIMMED ROUND AND THEIR EDGES SMOOTHED PRIOR TO FLIGHT. THE TRIMMED HOLE SHOULD NOT EXCEED 1.0 DIAMETER AND THE MINIMUM DISTANCE BETWEEN ADJACENT HOLES MUST BE TEN TIMES THE DIAMETER OF THE LARGEST HOLE

E. HOLES ARE ALLOWED IN THESE AREAS PROVIDING NONE EXCEED 0.5 DIAMETER AND THE MINIMUM DISTANCE BETWEEN ADJACENT HOLES IS NOT LESS THAN 5.0. HOLES IN THESE AREAS CAN RESULT IN FUEL CELL DAMAGE WHICH MUST BE EVALUATED AND REPAIRED AS DIRECTED IN PARA-10-18 AND 10-22 OR 10-46 AND 10-50

F. HOLES IN THESE AREAS MUST BE REPAIRED, HOWEVER, IF REQUIRED, THE RESTRICTIONS OF NOTE D. CAN BE APPLIED AND A ONE-TIME FLIGHT PERMITTED WITHIN THE FOLLOWING LIMITATIONS:
   1. 33,000 POUND MAXIMUM GROSS WEIGHT
   2. 6 HOUR MAXIMUM FLIGHT DURATION
   3. MINIMUM FLIGHT MANEUVERS

   REPAIR OF THE HOLES IS IMPERATIVE SUBSEQUENT TO THE LIMITED FLIGHT

G. HOLES IN THESE AREAS MUST BE REPAIRED, HOWEVER, IF REQUIRED, THE RESTRICTIONS OF NOTE D. CAN BE APPLIED AND A ONE-TIME FLIGHT PERMITTED WITHIN THE FOLLOWING LIMITATIONS:
   1. 33,000 POUND MAXIMUM GROSS WEIGHT
   2. 2 HOUR MAXIMUM FLIGHT DURATION
   3. MINIMUM FLIGHT MANEUVERS
   4. 3.0 FEET PER SECOND MAXIMUM LANDING SINK SPEED

   REPAIR OF THE HOLES IS IMPERATIVE SUBSEQUENT TO THE LIMITED FLIGHT

H. CRACKS IN ALL AREAS ARE PERMITTED, ONLY IF THEY ARE WITHIN THE LIMITATIONS FOR HOLES. CRACKS MUST BE STOP-DRILLED TO PREVENT FURTHER PROGRESSION. IF POSSIBLE, DAMAGE ABOVE WATERLINE 0.0 SHOULD HAVE A TEMPORARY PATCH APPLIED IN AREAS WHERE RAINTIGHTNESS IS REQUIRED. OPERATIONS OVER WATER SHOULD NOT BE ATTEMPTED IF UNREPAIRED DAMAGE EXISTS BELOW WATERLINE 0.0. ALL DAMAGE SHOULD BE PERMANENTLY REPAIRED AT THE EARLIEST CONVENIENCE. SEE FIG 2-7 FOR INFORMATION ON PATCHES

42x41

8114-190-345V

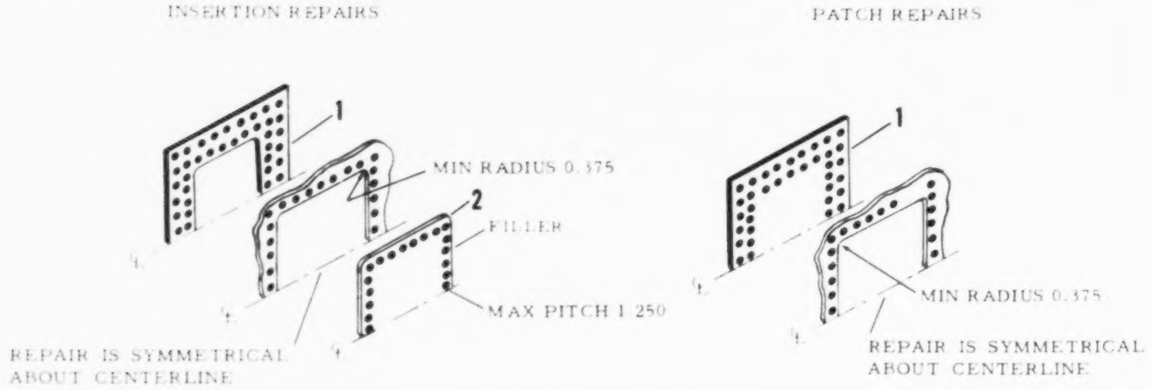
Figure 2-6. Body Skin Negligible Damage (Sheet 3 of 3)

watertight beams, and the partial beams in the forward part of the cabin fuselage structure assembly. The cargo tiedown adapter beams are at bl 0, sta 120 to 320 and 320 to 486, bl 20, each side of the fuselage; and bl 44, each side of the fuselage. The forward landing gear support beams are between sta 240 and 260, each side of the fuselage. The rescue hoist cutout watertight beams extend from sta 300 to 380, each side of the cutout. The partial beams are between sta 160 and 200, at bl 45.4, each side of the fuselage. The beams on the bottom panel are sealed for watertightness.

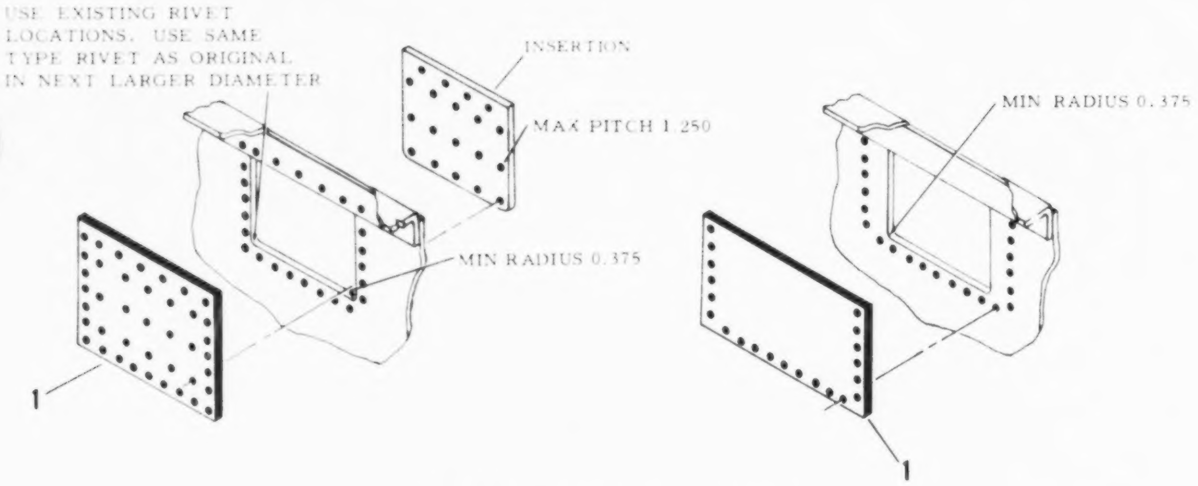
c. (See fig. 2-16, sheets 1 thru 6.) The beams in the aft fuselage structure assembly include two beams in each side panel, eight beams in the crown panel, seven beams in the bottom panel, and an aft drive shaft support beam. The side beams are located between sta 440 and 555 at wl 0 and between sta 440 and 575 at wl +29. The crown beams are located on each side at bl 20 and 11.5 between sta 440 and 482. Also located in the crown panel are the engine mount fitting support beams between sta 460 and 502. The aft crown beams are located between sta 440 and 627.5. The seven bottom panel beams are located as follows: bl 0 between sta 460 and 482, bl 20 and 44 each side of the body center line between sta 460 and 482 and approximately at bl 60 each side of the body center line between sta 460 and 482. The aft drive shaft support beam is located between sta 482 and 534 at wl +56.

d. (See fig. 2-12.) The beams in the cargo loading ramp assembly consist of aluminum alloy webs, reinforced with

LIGHTLY STRESSED REPAIRS


INSERTION REPAIRS
PATCH REPAIRS
1
MIN RADIUS 0.375
2
FILLER
MAX PITCH 1.250
REPAIR IS SYMMETRICAL ABOUT CENTERLINE
1
MIN RADIUS 0.375
REPAIR IS SYMMETRICAL ABOUT CENTERLINE

RECTANGULAR DAMAGE CUTOUT


USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVET AS ORIGINAL IN NEXT LARGER DIAMETER
INSERTION
MAX PITCH 1.250
MIN RADIUS 0.375
1
MIN RADIUS 0.375
1

DAMAGE NEAR EXISTING STRUCTURE

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS. USE SAME MATERIAL AND THICKNESS AS ORIGINAL IF SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL.

NOTE

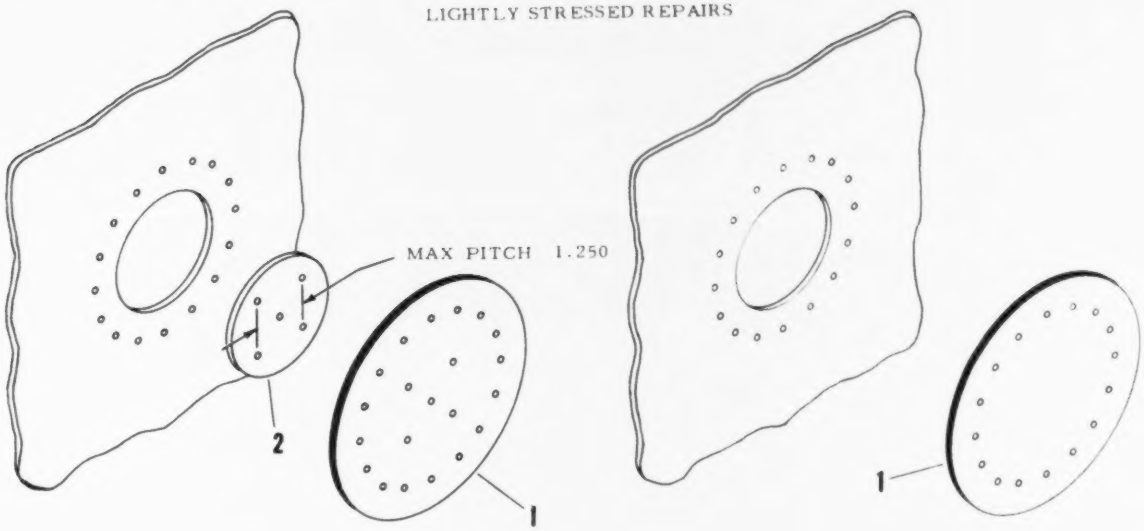
ALL DIMENSIONS ARE IN INCHES

42x51

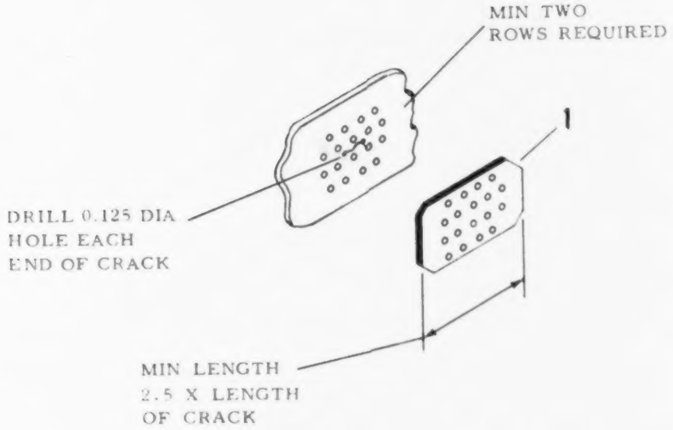
B114 18 34S

Figure 2-7. Skin and Web Repairs (Sheet 1 of 9)

LIGHTLY STRESSED REPAIRS


MAX PITCH 1.250
2
1
1

CIRCULAR DAMAGE CUTOUT


MIN TWO
ROWS REQUIRED
1
DRILL 0.125 DIA
HOLE EACH
END OF CRACK
MIN LENGTH
2.5 X LENGTH
OF CRACK

CRACK

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS. USE SAME MATERIAL AND THICKNESS AS ORIGINAL IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

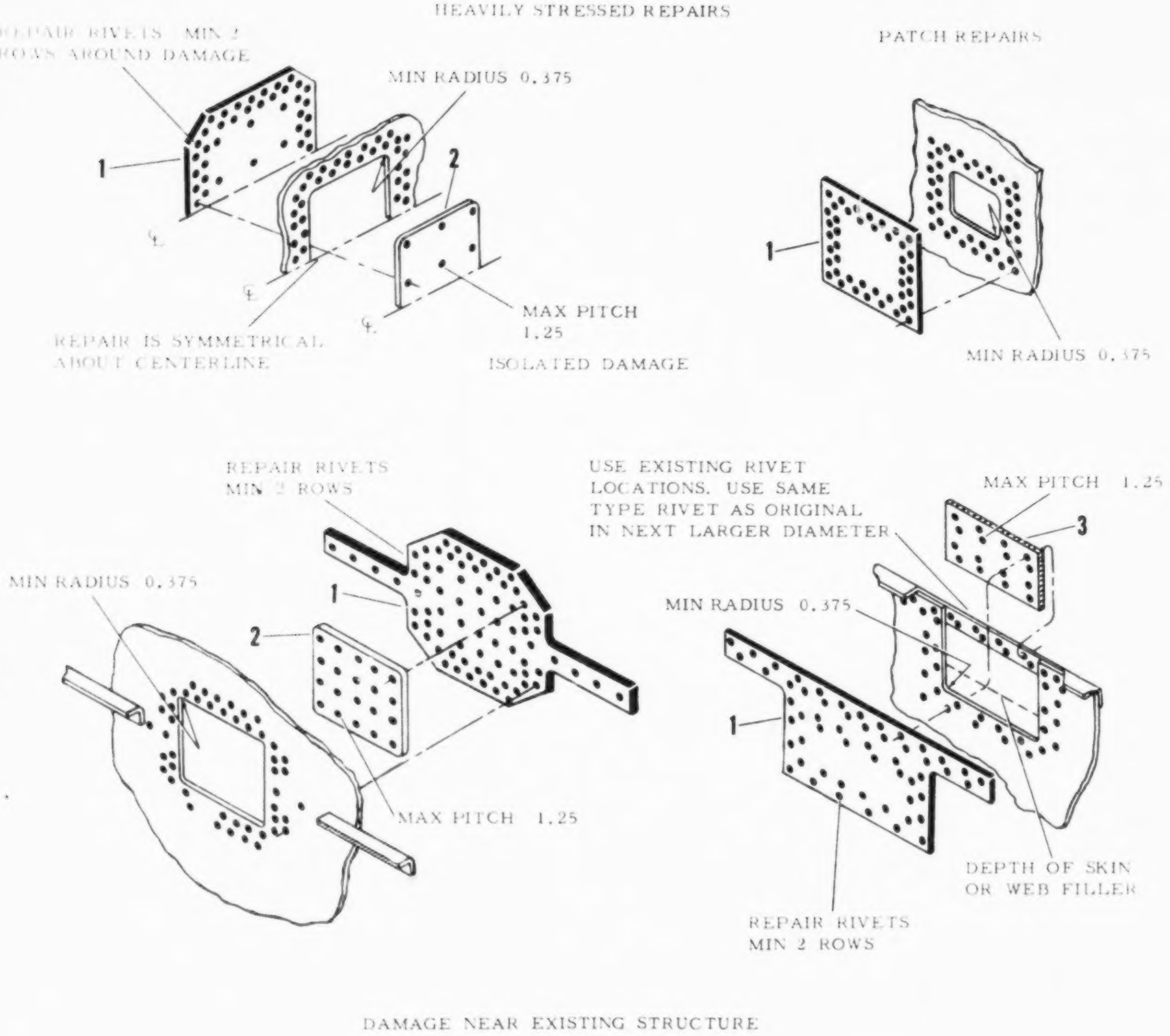
NOTES

A. ALL DIMENSIONS ARE IN INCHES

42x51

B114 19-34S

Figure 2-7. Skin and Web Repairs (Sheet 2 of 9)


HEAVILY STRESSED REPAIRS
REPAIR RIVETS - MIN 2 ROWS AROUND DAMAGE
MIN RADIUS 0.375
1
2
℄
℄
℄
MAX PITCH 1.25
REPAIR IS SYMMETRICAL ABOUT CENTERLINE
ISOLATED DAMAGE
PATCH REPAIRS
1
MIN RADIUS 0.375
REPAIR RIVETS MIN 2 ROWS
MIN RADIUS 0.375
1
2
MAX PITCH 1.25
USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVET AS ORIGINAL IN NEXT LARGER DIAMETER
MAX PITCH 1.25
3
MIN RADIUS 0.375
1
DEPTH OF SKIN OR WEB FILLER
REPAIR RIVETS MIN 2 ROWS
DAMAGE NEAR EXISTING STRUCTURE

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS,SEE SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL
3. FILLER. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. A STRAP PATCH, SHOWN ON SHEET 5 OF THIS FIGURE, CAN BE USED AS AN ALTERNATE FOR THE TABS SHOWN ON REINFORCEMENTS (1)

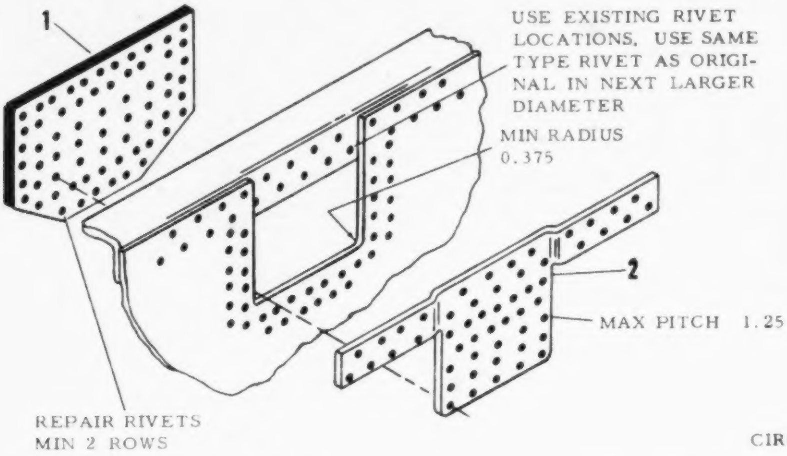
42x51

B114-20-34S

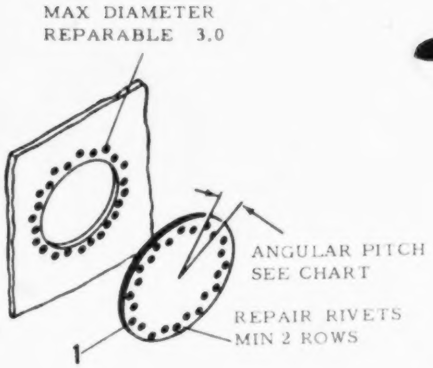
Figure 2-7. Skin and Web Repairs (Sheet 3 of 9)

HEAVILY-STRESSED SKIN REPAIRS

INSERTION REPAIRS

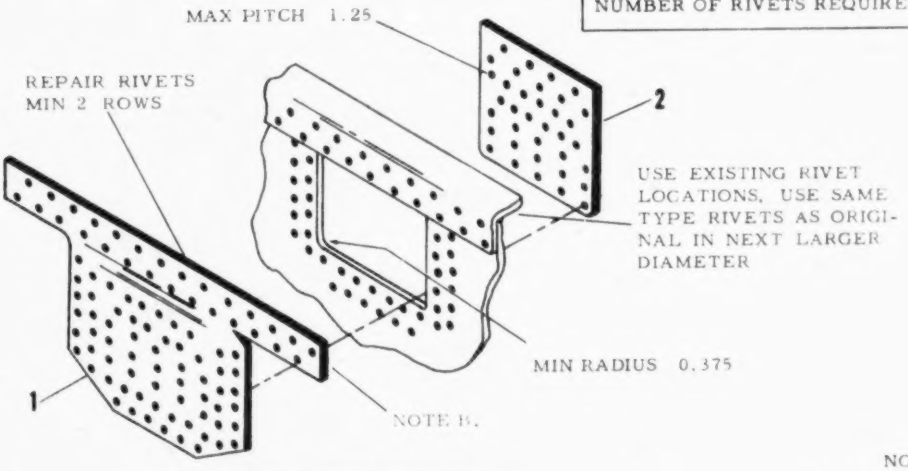

1
USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVET AS ORIGINAL IN NEXT LARGER DIAMETER
MIN RADIUS 0.375
2
MAX PITCH 1.25
REPAIR RIVETS MIN 2 ROWS

DAMAGE NEAR PRIMARY HORIZONTAL MEMBER


MAX DIAMETER REPARABLE 3.0
ANGULAR PITCH SEE CHART
REPAIR RIVETS MIN 2 ROWS
1

CIRCULAR DAMAGE REPAIR

DESIGNATION	HOLE DIAMETER		
	1.0	2.0	3.0
OD OF CIRCULAR REINFORCEMENT	2.50	5.0	7.50
DIAMETER OF OUTER RIVET CIRCLE	1.750	4.0	6.50
DIAMETER OF INNER RIVET CIRCLE	-	3.0	4.0
(AP) ANGULAR RIVET PITCH	45°	22°30'	15°
NUMBER OF RIVETS REQUIRED (MIN)	8	16	24


MAX PITCH 1.25
REPAIR RIVETS MIN 2 ROWS
2
USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVETS AS ORIGINAL IN NEXT LARGER DIAMETER
MIN RADIUS 0.375
1
NOTE B.

DAMAGE NEAR ADJACENT MEMBER

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS. SEE SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. A STRAP PATCH, SHOWN ON SHEET 5 OF THIS FIGURE, CAN BE USED AS AN ALTERNATE FOR THE TABS SHOWN ON REINFORCEMENTS (1)

42x51

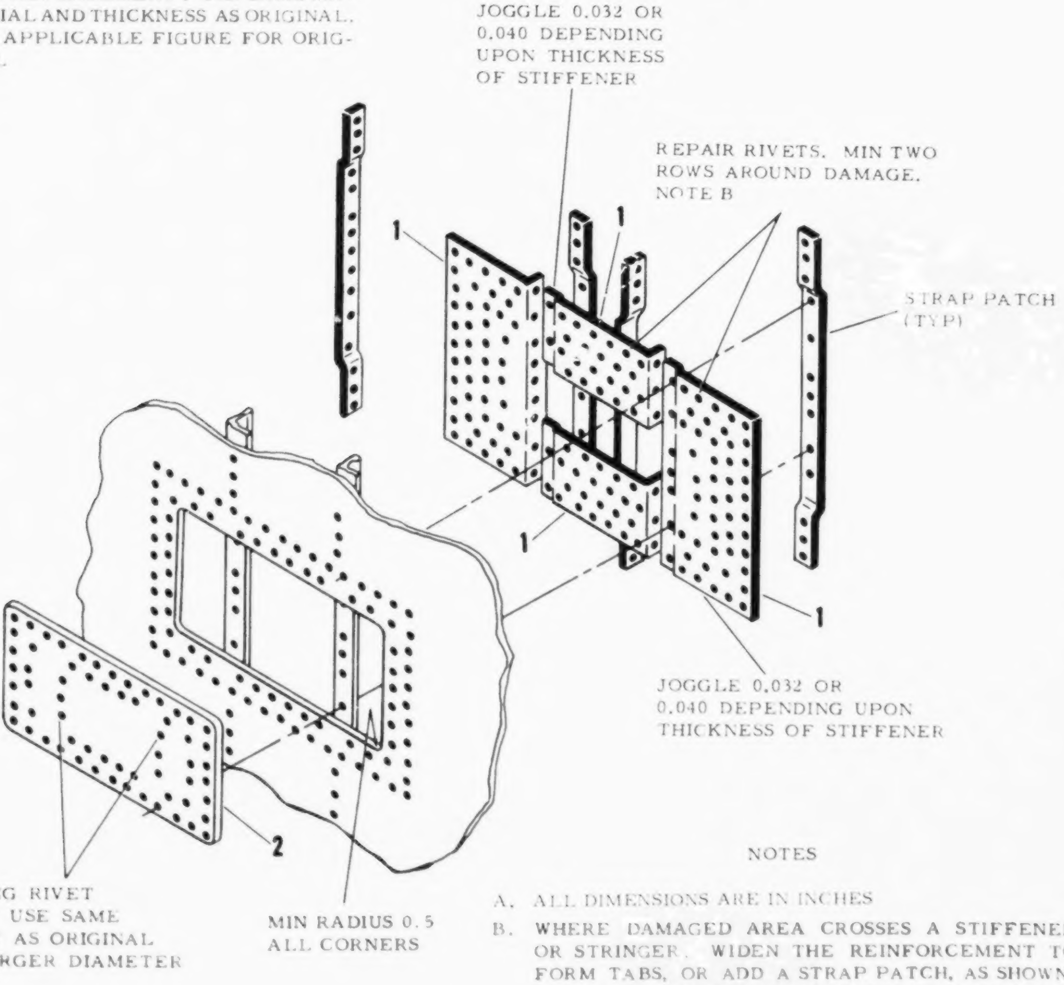
B114-21-34S

Figure 2-7. Skin and Web Repairs (Sheet 4 of 9)

INSERTION SKIN REPAIR ACROSS STIFFENERS

REPAIR PARTS

1. SKIN REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS. SEE SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. SKIN REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL


JOGGLE 0.032 OR 0.040 DEPENDING UPON THICKNESS OF STIFFENER
REPAIR RIVETS. MIN TWO ROWS AROUND DAMAGE. NOTE B
1
1
STRAP PATCH (TYP)
1
1
JOGGLE 0.032 OR 0.040 DEPENDING UPON THICKNESS OF STIFFENER
2
USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVET AS ORIGINAL IN NEXT LARGER DIAMETER
MIN RADIUS 0.5 ALL CORNERS

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. WHERE DAMAGED AREA CROSSES A STIFFENER OR STRINGER, WIDEN THE REINFORCEMENT TO FORM TABS, OR ADD A STRAP PATCH, AS SHOWN. PICK UP A TOTAL OF FIVE RIVETS EACH SIDE FOR SINGLE-ROW PATTERNS, EIGHT RIVETS EACH SIDE FOR MULTIPLE-ROW PATTERNS

42x51

B114-22-34S

Figure 2-7. Skin and Web Repairs (Sheet 5 of 9)

REINFORCEMENT SELECTION

2024-T3 AND T4 REPAIR
WITH 2024-T3, AND 7075-T6
REPAIR WITH 7075-T6

ORIGINAL THICKNESS	REINFORCEMENT THICKNESS
0.012	0.016
0.016	0.020
0,020	0,025
0,025	0.032
0,032	0,040
0,040	0,050
0,050	0,050
0,063	0,063
0,071	0,071
0,080	0,081
0,090	0,090
0,100	0,100
0,125	0,125

7075-T6 REPAIR WITH 2024-T3

ORIGINAL THICKNESS	REINFORCEMENT THICKNESS
0.012	0.020
0.016	0.025
0,020	0,032
0,025	0,040
0,032	0,050
0,040	0,063
0,050	0,071
0,063	0,080
0,071	0,090
0,080	0,100
0,090	0,125
0,100	0,160
0,125	0,160

301 AND 302
REPAIR WITH SAME MATERIAL

ORIGINAL THICKNESS	REINFORCEMENT THICKNESS
0.012	0.016
0.016	0.020
0.020	0.025
0.025	0.032
0.032	0.036
0.036	0.040
0.040	0.040

NOTES

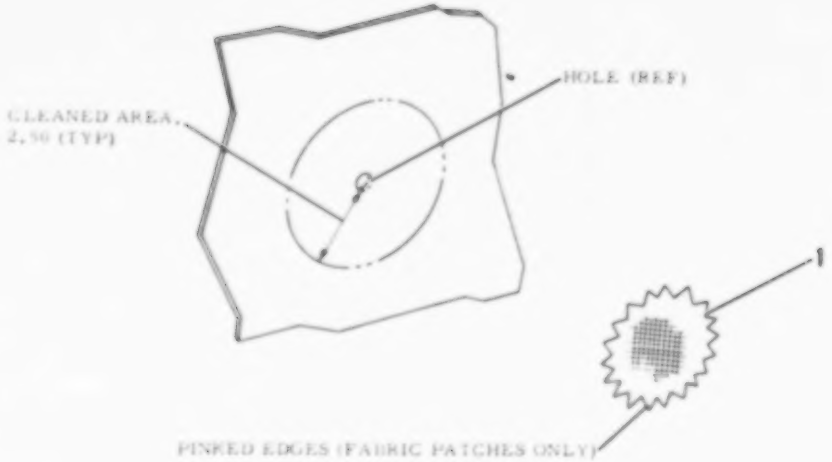
A. ALL DIMENSIONS ARE IN INCHES
B. THESE CHARTS MAY BE USED TO SELECT A REINFORCEMENT WHEN A SPECIFIC REPAIR FIGURE DENOTING A SPECIFIC REPAIR MATERIAL, DOES NOT EXIST FOR A PARTICULAR PART

42x51

BH4-23-345H

Figure 2-7. Skin and Web Repairs (Sheet 6 of 9)

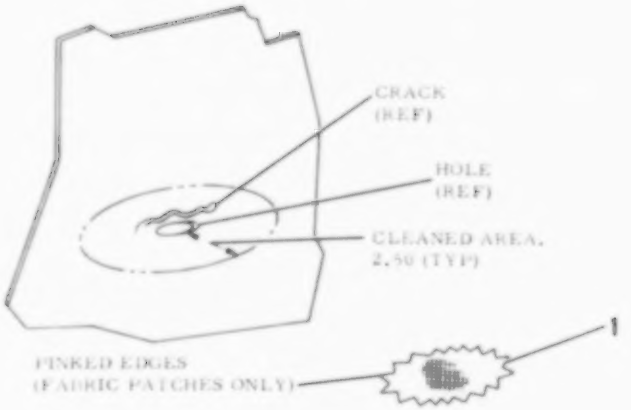
CIRCULAR HOLES


HOLE (REF)
CLEANED AREA, 2.50 (TYP)
1
PINKED EDGES (FABRIC PATCHES ONLY)

REPAIR PARTS

1. PATCH, COTTON CLOTH (C-105) OR TAPE (C340)

CRACKS AND OVAL HOLES


CRACK (REF)
HOLE (REF)
CLEANED AREA, 2.50 (TYP)
PINKED EDGES (FABRIC PATCHES ONLY)
1

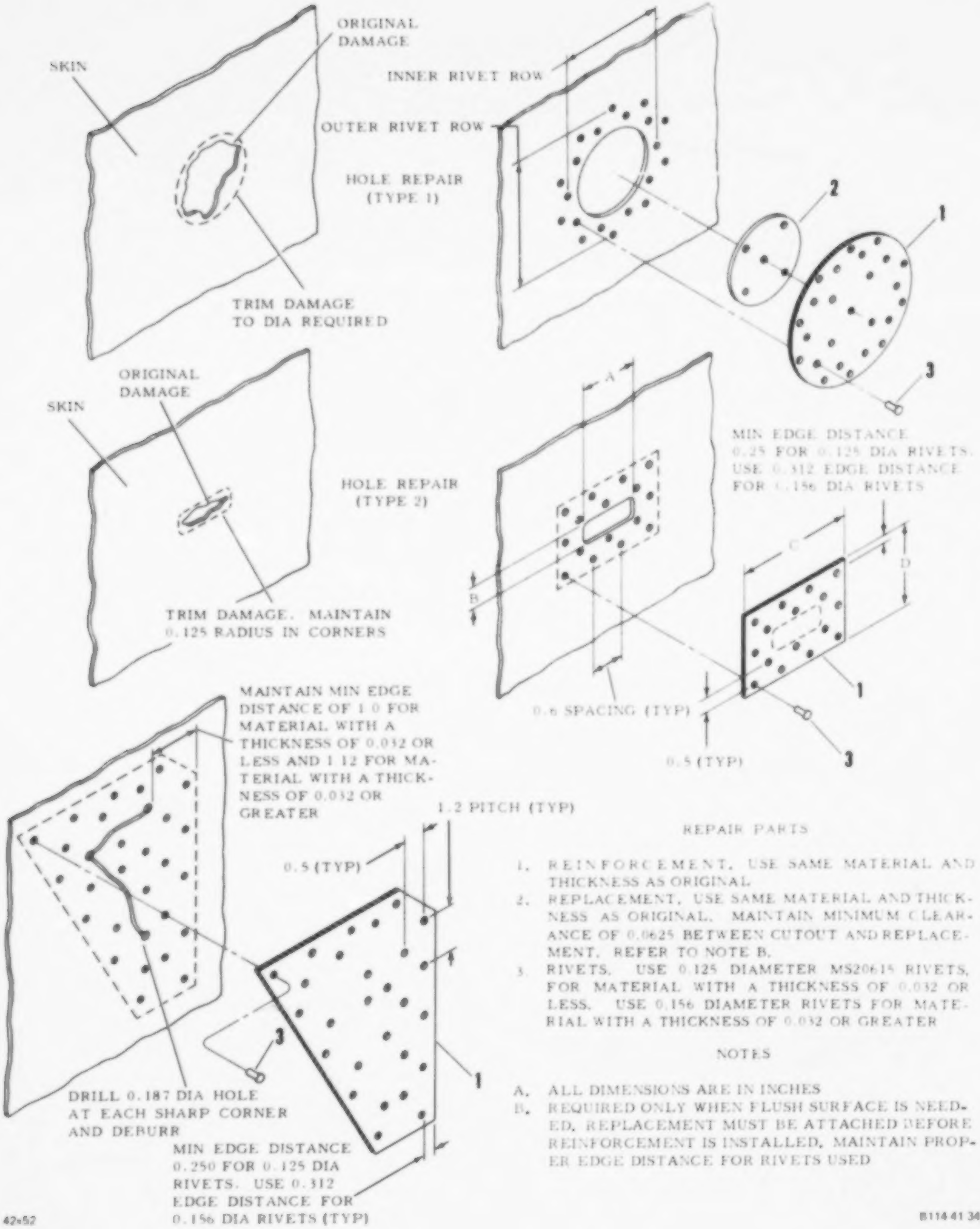
NOTE

ALL DIMENSIONS ARE IN INCHES

42x51

B114-24-345V

Figure 2-7. Skin and Web Repairs (Sheet 7 of 9)


ORIGINAL DAMAGE
SKIN
TRIM DAMAGE TO DIA REQUIRED
INNER RIVET ROW
OUTER RIVET ROW
HOLE REPAIR (TYPE 1)
2
1
3
ORIGINAL DAMAGE
SKIN
TRIM DAMAGE. MAINTAIN 0.125 RADIUS IN CORNERS
HOLE REPAIR (TYPE 2)
A
B
C
D
MIN EDGE DISTANCE 0.25 FOR 0.125 DIA RIVETS. USE 0.312 EDGE DISTANCE FOR 0.156 DIA RIVETS
0.6 SPACING (TYP)
0.5 (TYP)
1
3
MAINTAIN MIN EDGE DISTANCE OF 1.0 FOR MATERIAL WITH A THICKNESS OF 0.032 OR LESS AND 1.12 FOR MATERIAL WITH A THICKNESS OF 0.032 OR GREATER
1.2 PITCH (TYP)
0.5 (TYP)
3
1
DRILL 0.187 DIA HOLE AT EACH SHARP CORNER AND DEBURR
MIN EDGE DISTANCE 0.250 FOR 0.125 DIA RIVETS. USE 0.312 EDGE DISTANCE FOR 0.156 DIA RIVETS (TYP)
42x52
B114 41 345

REPAIR PARTS

1. REINFORCEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL.
2. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. MAINTAIN MINIMUM CLEARANCE OF 0.0625 BETWEEN CUTOUT AND REPLACEMENT. REFER TO NOTE B.
3. RIVETS. USE 0.125 DIAMETER MS20615 RIVETS, FOR MATERIAL WITH A THICKNESS OF 0.032 OR LESS. USE 0.156 DIAMETER RIVETS FOR MATERIAL WITH A THICKNESS OF 0.032 OR GREATER

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REQUIRED ONLY WHEN FLUSH SURFACE IS NEEDED. REPLACEMENT MUST BE ATTACHED BEFORE REINFORCEMENT IS INSTALLED. MAINTAIN PROPER EDGE DISTANCE FOR RIVETS USED

Figure 2-7. Skin and Web Repairs (Sheet 8 of 9)

CRITERIA FOR HOLE REPAIR (TYPE 1)

REPLACEMENT (2) DIAMETER*	RIVET ROW DIAMETER*		PATCH (1) DIAMETER*
	INNER**	OUTER	
--	0.75 0.87	1.25 1.37	1.75 1.87
--	0.875 0.995	1.375 1.495	1.875 1.995
0.50	1.0 1.12	1.5 1.62	2.0 2.12
0.625	1.125 1.245	1.625 1.745	2.125 2.245
0.75	1.25 1.37	1.75 1.87	2.25 2.37
0.875	1.375 1.495	1.875 1.995	2.375 2.495
1.0	1.5 1.62	2.0 2.12	2.5 2.62
1.25	1.75 1.87	2.25 2.37	2.75 2.87
1.50	2.0 2.12	2.5 2.62	3.0 3.12
1.75	2.25 2.37	2.75 2.87	3.25 3.37

*DIMENSIONS ABOVE DIAGONAL LINE ARE FOR MATERIAL THICKNESS LESS THAN 0.04, THOSE BELOW ARE FOR MATERIAL THICKNESS GREATER THAN 0.032

**MAINTAIN 0.6 PITCH AND STAGGER OUTER ROW BETWEEN INNER ROW

NOTES

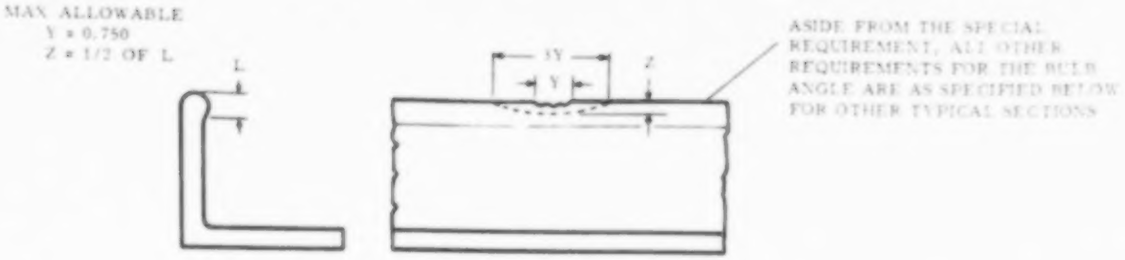
A. ALL DIMENSIONS ARE IN INCHES

B. DETERMINE PATCH DIMENSIONS D AND C FOR HOLE REPAIR (TYPE 2) AS FOLLOWS:

  1. D = B +1,0, IF MATERIAL THICKNESS IS LESS THAN 0,04
     D = B +1,62, IF MATERIAL THICKNESS IS GREATER THAN 0,032
  2. C = A +1,0, IF MATERIAL THICKNESS IS LESS THAN 0,04
     C = A +1,12, IF MATERIAL THICKNESS IS GREATER THAN 0,032

B114 42 345

Figure 2-7. Skin and Web Repairs (Sheet 9 of 9)


MAX ALLOWABLE
Y = 0.750
Z = 1/2 OF L
L
3Y
Y
Z
ASIDE FROM THE SPECIAL REQUIREMENT, ALL OTHER REQUIREMENTS FOR THE BULB ANGLE ARE AS SPECIFIED BELOW FOR OTHER TYPICAL SECTIONS

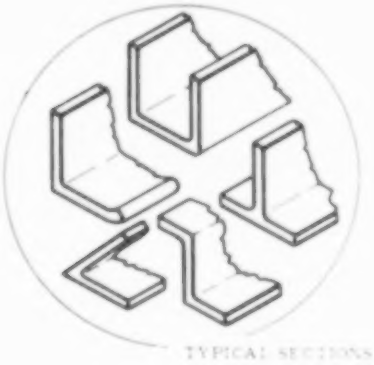
SPECIAL REQUIREMENT FOR BULB ANGLES

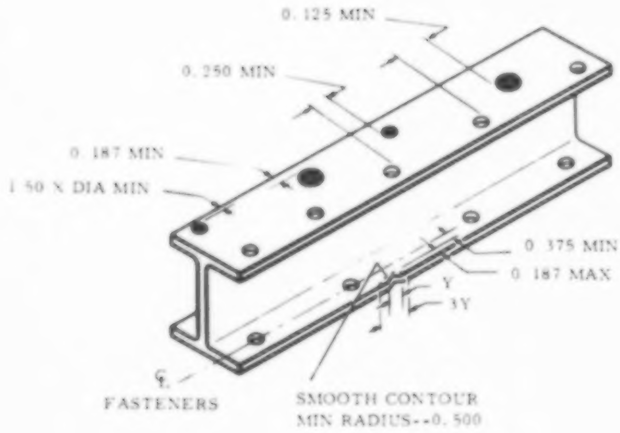
NOTE

ALL DIMENSIONS ARE SHOWN IN INCHES UNLESS OTHERWISE NOTED

SYMBOLS

○ --ATTACHMENT HOLE
● --0.3125 MAX DIA HOLE.
● --DENT.

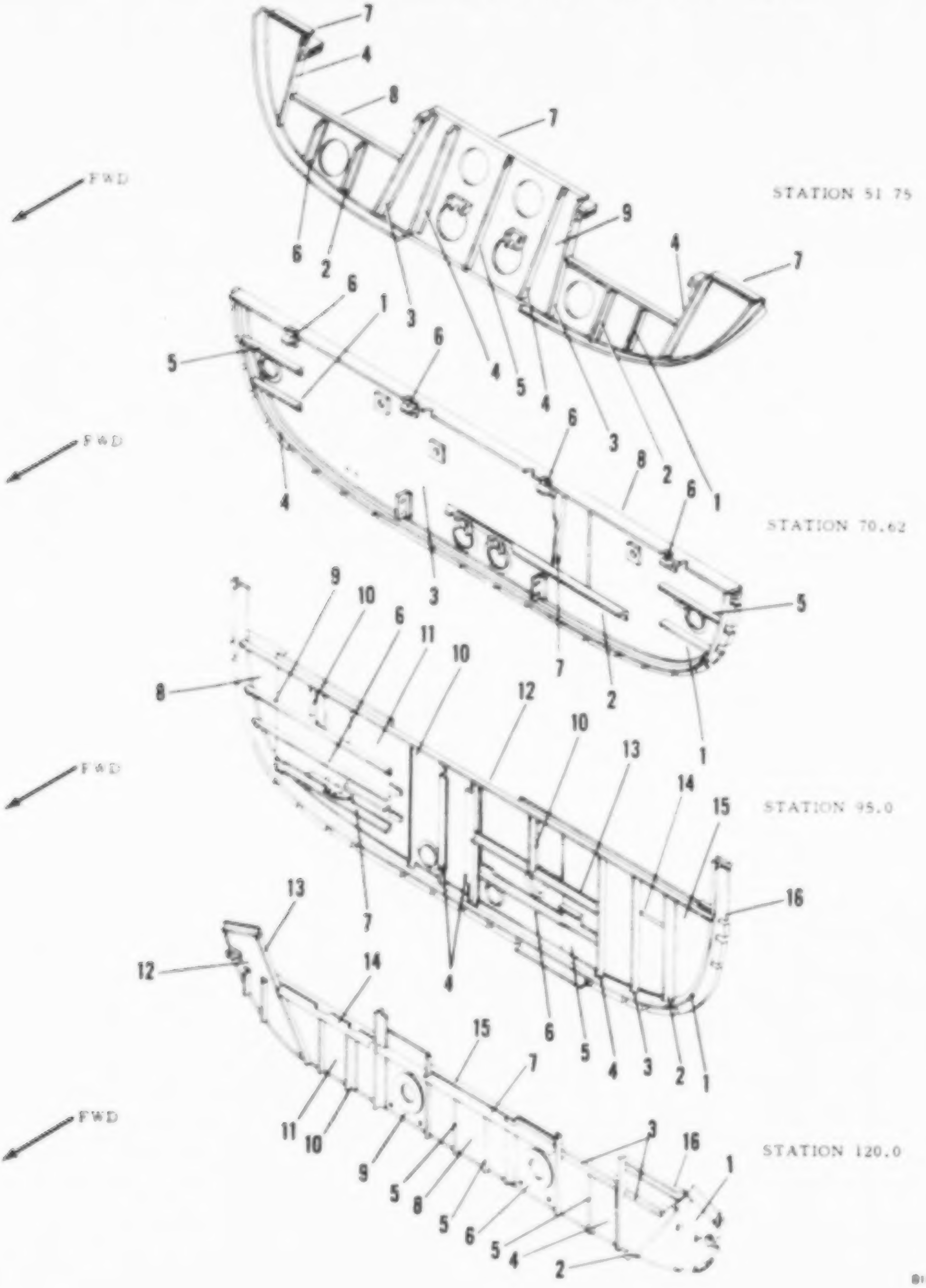

TYPICAL SECTIONS


0.125 MIN
0.250 MIN
0.187 MIN
1.50 X DIA MIN
0.375 MIN
0.187 MAX
Y
3Y
℄
FASTENERS
SMOOTH CONTOUR
MIN RADIUS--0.500

B114-197-355

Figure 2-8. Extruded Parts Negligible Damage

FLOOR FORMERS--STATIONS 51.75 (CANTED), 70.62, 95.0 AND 120.0


STATION 51.75
7
4
8
7
9
4
7
6
2
3
4
5
4
3
2
1
FWD
STATION 70.62
5
6
1
3
6
6
8
2
6
1
4
3
7
2
5
1
FWD
STATION 95.0
9
10
6
11
10
8
12
10
13
14
15
16
7
4
6
5
4
3
2
1
FWD
STATION 120.0
13
12
14
15
7
11
10
9
5
8
5
6
5
4
2
3
16
1

8114-140-355

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 9)

FLOOR FORMERS--STATIONS 51.75 (CANTED), 70.62, 95.0, AND 120.0

FORMER--STATION 51.75 (CANTED)

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STIFFENER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
2	STIFFENER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
3	STIFFENER	ALCOA 9802 7075-T6	0.063 4130	--
4	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
5	STIFFENER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
6	STIFFENER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
7	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
8	CAP	ALCOA 9802 7075-T6	0.063 4130	--
9	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7

FORMER--STATION 70.62

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STIFFENER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
2	STIFFENER	ALCOA 28546 7075-T6	0.071 4130	--
3	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	2-7
4	CAP	ALCOA 67580 7075-T6	0.063 4130	--
5	STIFFENER	0.025 2024-T4 BARE	0.032 2024-T3 CLAD	--
6	FITTING	ALCOA 76959 7075-T6	NOTE B.	--
7	STIFFENER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
8	CAP	REYNOLDS 11416 7075-T6	0.071 4130	--

FORMER--STATION 95.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 80759 7075-T6	0.190 4130	--
2	STIFFENER	AND10133-0601 7075-T6	0.071 4130	--
3	STIFFENER	ALCOA 22653 7075-T6	0.080 4130	--
4	STIFFENER	ALCOA 59675 7075-T6	0.050 4130	--
5	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
6	STIFFENER	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
7	STIFFENER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
8	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
9	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
10	SUPPORT	AND10134-1201 7075-T6	0.071 4130	--
11	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
12	CAP	AND10134-1205 7075-T6	0.100 4130	--
13	STIFFENER	AND10134-1003 7075-T6	0.071 4130	--
14	STIFFENER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
15	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
16	SKIRT	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	--

FORMER--STATION 120.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
2	CAP	ALCOA 2129 7075-T6	0.160 4130	--
3	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
4	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
5	STIFFENER	ALCOA 67580 7075-T6	0.063 4130	--
6	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
7	CHANNEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
8	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
9	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
10	STIFFENER	ALCOA 67580 7075-T6	0.063 4130	--
11	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
12	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
13	CAP	0.090 7075-T6 BARE	0.100 7075-T6 CLAD	--
14	CHANNEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
15	CAP	ALCOA 33811 7075-T6	0.160 4130	--
16	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE FITTINGS WITH SECTION OF ORIGINAL MATERIAL

42x53

8114-141-345V

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 9)

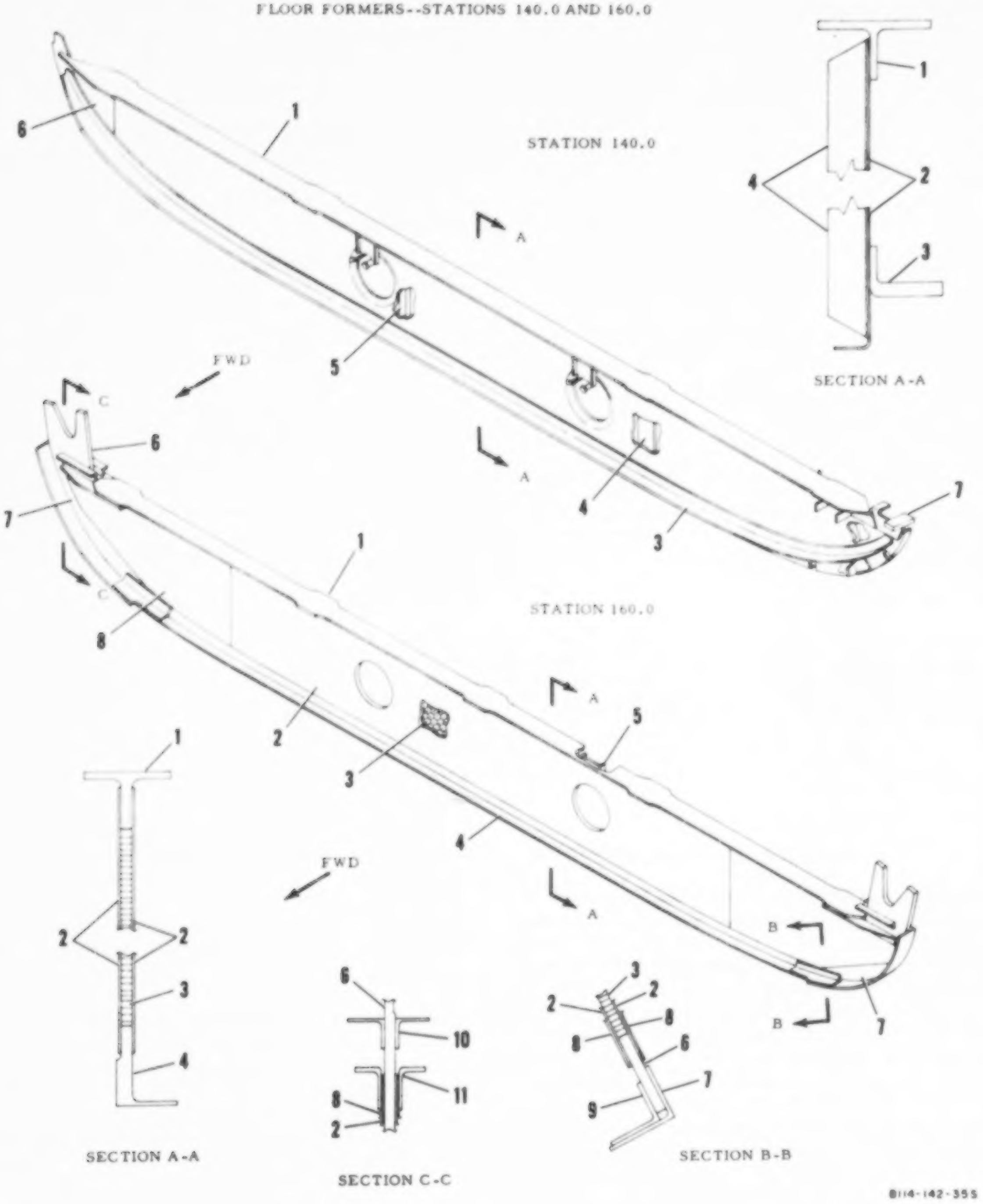

FLOOR FORMERS--STATIONS 140.0 AND 160.0
STATION 140.0
1
2
3
4
5
6
7
A
A
FWD
SECTION A-A
STATION 160.0
C
C
B
B
8
SECTION A-A
SECTION C-C
10
11
9
SECTION B-B
8114-142-355

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 3 of 9)

FLOOR FORMERS--STATIONS 140.0 AND 160.0

FLOOR FORMER--STATION 140.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 12756 7075-T6	0.160 4130	--
2	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
3	CAP	PHS90104 7075-T6	NOTE B.	--
4	STIFFENER	ALCOA 22981 7075-T6	0.063 4130	--
5	STIFFENER	ALCOA 12883 7075-T6	0.063 4130	--
6	PLATE	0.080 7075-T6 BARE	0.090 7075-T6 CLAD	2-7
7	ATTACHMENT	REYNOLDS 6447 7075-T6	NOTE C.	--

FLOOR FORMER--STATION 160.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	VS90302 7075-T6	NOTE D.	--
2	SKIN	0.020 7075-T6 BARE	NOTE D.	--
3	CORE	0.255 3.0 3/8-20N-3003	NOTE D.	--
4	CAP	VS90526 7075-T6	NOTE D.	--
5	BRACKET	0.025 2024-T4 CLAD	NOTE E.	--
6	ATTACHMENT	0.250 7075-T6 BARE	NOTE D.	--
7	CAP	ALCOA 11638 7075-T6	0.100 4130	--
8	DOUBLER	0.016 7075-T6 BARE	0.020 7075-T6 CLAD	2-7
9	ANGLE	0.080 7075-T6 BARE	0.090 7075-T6 CLAD	--
10	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
11	ANGLE	ALCOA 51919 7075-T6	0.071 4130	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE DAMAGED SECTION WITH A CORRESPONDING SECTION OF ORIGINAL MATERIAL
C. REPLACE WITH NEW ATTACHMENT 114S1833-5
D. COMPONENT OF BONDED ASSEMBLY. REFER TO PARA 2-631 FOR INFORMATION ON REPAIR OF SANDWICH HONECOMB STRUCTURES
E. REPLACE WITH NEW BRACKET 114E4054-9

42x37

B114-143-345V

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 4 of 9)

extruded caps and stiffeners. Two full-length beams are installed laterally between bl 20 and 44 and on each side of the ramp at ramp sta 23.84 and 52.92. The other beams, including the tiedown adapter beams, are installed longitudinally at bl 20, 44, and 48.5 each side of the center line. An extruded cap of VS90413 is attached at bl 20 to the inboard side of the beams which extend between ramp sta 10.07 and 98.99. Five beams are installed forward of ramp sta 10.07 on each side of the ramp center line at bl 3.5, 10.64, 14.89, 28.6, and 36.2 to which the ramp former at fuselage sta 488.33 is attached. Beams are installed longitudinally between ramp sta 83.6 and 98.99 on the ramp center line and bl 15 each side.

e. (See fig. 2-16, sheets 7 and 8.) The beams in the aft pylon structure assembly are thrust bearing and aft transmission support members. The beams are located between sta 534 and 575.5, on each side of the center line, at bl 8. Support brackets for flight control hydraulic system tanks are attached to each beam. A rubber grommet, or a rubberized cork pad, is bonded to each bracket.

2-45. *Inspection*.

Following inspection, damage to the beams should be classified as negligible, reparable, or necessitating replacement.

2-46. Negligible Damage. Damage which can be permitted to exist as is, or corrected by a simple procedure, such as burnishing nicks and scratches and the removal of small damaged areas is negligible. Damage must clear all bolts, rivets, and radiuses a minimum of ¾ inch and not affect more than 10 percent of the thickness of the material after rework. See fig. 2-3 and 2-8 for examples of damage to internal webs, formed parts, and extruded parts.

2-47. Reparable Damage (AVIM). Damage exceeding negligible limits, but not affecting more than 25 percent of the cross section between attaching members of the web, can be repaired by patching provided that sufficient clearance is maintained from the edge members to allow proper rivet spacing. Damage which affects more than 25 percent of the cross section of the web, should be repaired by insertion. See fig. 2-7 for typical repairs to webs.

2-48. Damage Necessitating Replacement (AVIM). Extensive damage, such as the loss of a major portion of a beam section or an individual member, necessitates replacement of the beam section, or of the individual member.

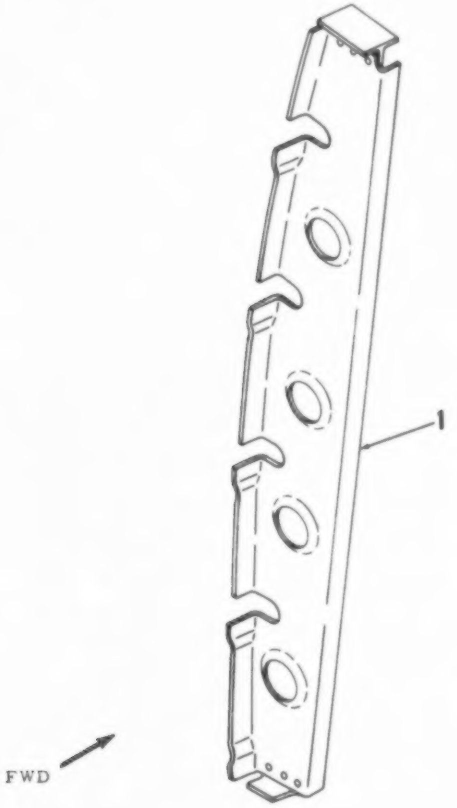
2-49. Stiffeners.

The skin stiffeners (Refer to FO-2 for stiffener identification.) are located on the bottom panel and the bottom side panel. The transverse stiffeners on the bottom panel, except those encompassing the rescue hatch cutout, extend the full width of the panel (hinge to hinge) and are formed Z-sections of 7075-T6 clad aluminum alloy. The longitudinal and transverse stiffeners on the bottom panel, reinforcing the area of the rescue hatch cutout, are extruded sections of 7075-T6 aluminum alloy. The longitudinal stiffeners on the bottom panel are sections of Alcoa 83264 or AND10136-2006. The transverse stiffeners are sections of Alcoa 83264 or 55794. The stiffeners on the bottom side panels are sections of AND10134-1005, AND10134-1003, Alcoa 67580, or 22477.

2-50. Inspection.

Following inspection, damage to the stiffeners should be classified as negligible, reparable, or necessitating replacement.

SIDE FORMER--STATION 110.5 LH SIDE



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FORMER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7

NOTE

ALL DIMENSIONS ARE IN INCHES

42x41

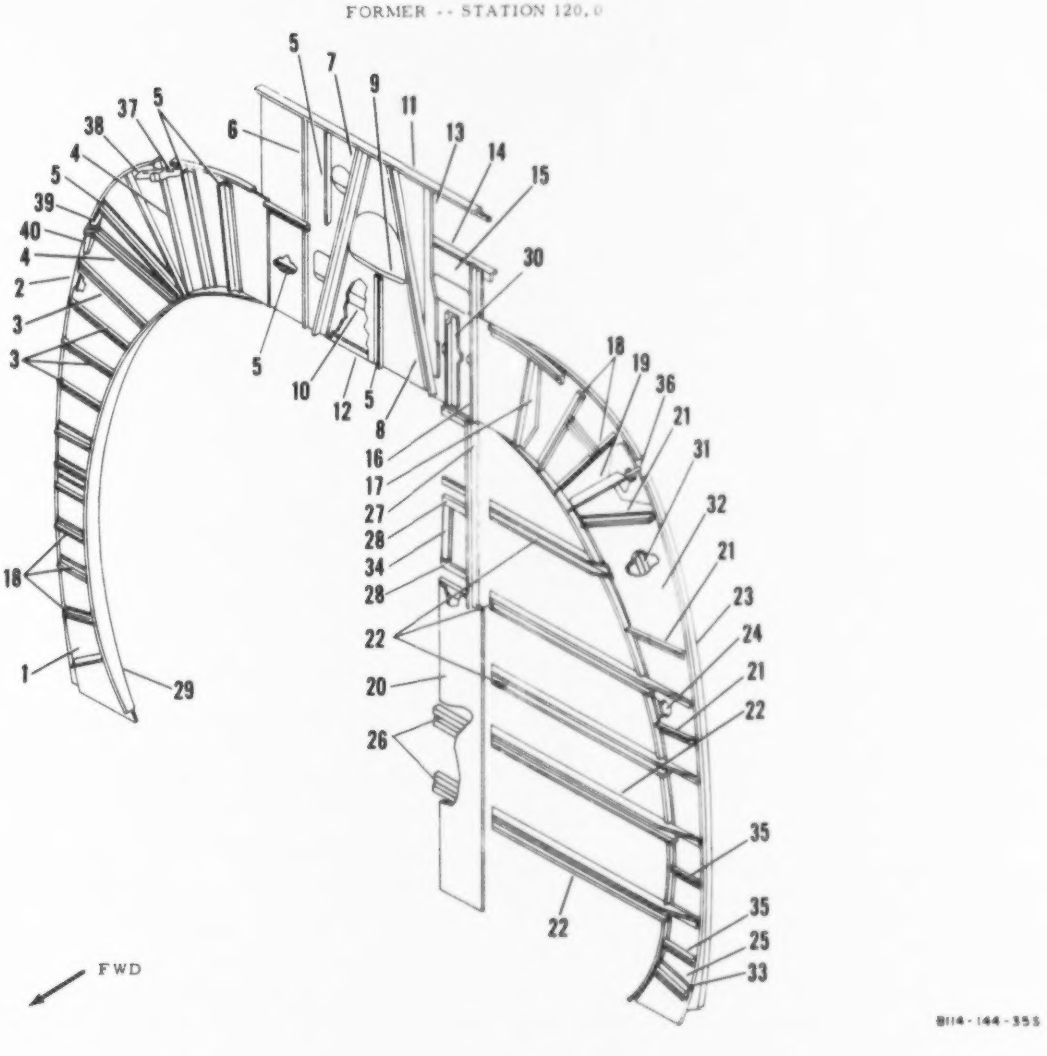
8114-373-34SV

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 5 of 9)

2-51. ***Negligible Damage.*** See fig. 2-3 for examples of damage to the formed stiffeners. Refer to para 2-583 for examples of damage to the extruded parts.

2-52. ***Reparable Damage (AVIM).*** Damage to formed parts more extensive than negligible, can be repaired by patching if damage affects only a single formed flange and is less than one-half of web cross section. If damage affects more than one flange, and one-half or more of web cross section, it should be repaired by insertion. Refer to para 2-583 for damage classification for extruded parts.

2-53. ***Damage Necessitating Replacement (AVIM).*** Extensive damage such as the loss of more than 50 percent of the length of a member or numerous isolated damages, necessitates replacement of the member.


FORMER -- STATION 120.0
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2
3
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30
5
10
12
5
8
18
19
36
21
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32
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23
24
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22
22
20
26
35
22
35
25
33
18
1
29
FWD
8114-144-355

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 6 of 9)

FORMER -- STATION 120.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.040 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
2	CAP	AND10134-1403 7075-T6	0.100 4130	--
3	STIFFENER	ALCOA 12883 7075-T6	0.063 4130	--
4	STIFFENER	ALCOA 60242 7075-T6	0.071 4130	--
5	STIFFENER	AND10133-0601 7075-T6	0.063 4130	--
6	STIFFENER	AND10133-1001 7075-T6	0.063 4130	--
7	ANGLE	0.090 301 CRES	0.090 301 CRES	--
8	ANGLE	0.090 301 CRES	0.090 301 CRES	--
9	CAP	AND10134-1406 7075-T6	0.100 4130	--
10	ANGLE	ALCOA 60806 7075-T6	0.080 4130	--
11	ANGLE	AND10134-1407 7075-T6	0.125 4130	--
12	CAP	ALCOA 60830 7075-T6	0.160 4130	--
13	STIFFENER	0.063 301 CRES	0.063 301 CRES	--
14	STIFFENER	BAC1503-100043 7075-T6	0.071 4130	--
15	WEB	0.040 301 CRES	0.040 301 CRES	2-7
16	STIFFENER	AND10134-1602 7075-T6	0.125 4130	--
17	STIFFENER	ALCOA 22991 7075-T6	0.063 4130	--
18	STIFFENER	ALCOA 67580 7075-T6	0.063 4130	--
19	STIFFENER	ALCOA 27076 7075-T6	0.063 4130	--
20	WEB	0.025 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
21	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
22	CHANNEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
23	CAP	AND10134-1401 7075-T6	0.100 4130	--
24	CAP	ALCOA 22892 7075-T6	0.100 4130	--
25	WEB	0.032 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
26	HAT	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
27	BRACKET	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
28	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
29	CAP	ALCOA 12756 7075-T6	0.160 4130	--
30	TEE	AND10136-2405 7075-T6	0.125 4130	--
31	HAT	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
32	WEB	0.025 7075-T6 BARE	0.040 7075-T6 CLAD	--
33	TEE	AND10136-1501 7075-T6	0.080 4130	--
34	STRAP	0.032 2024-T4 CLAD	0.036 4130	--
35	STIFFENER	ALCOA 67580 7075-T6	0.036 4130	--
36	FITTING	2014-T6	NOTE B.	--
37	FITTING	2014-T6	NOTE C.	--
38	FITTING	2014-T6	NOTE D.	--
39	FITTING	2014-T6	NOTE E.	--
40	FITTING	2014-T6	NOTE F.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW FITTING 114S1824-1 UPPER, AND 114S1824-3 LOWER
C. REPLACE WITH NEW FITTING 114S1832-1 FWD, AND 114S1831-1 AFT
D. REPLACE WITH NEW FITTING 114S1832-3 FWD, AND 114S1831-3 AFT
E. REPLACE WITH NEW FITTING 114S1830-3 FWD, AND 114S1830-1 AFT
F. REPLACE WITH NEW FITTING 114S1830-7 FWD, AND 114S1830-5 AFT

42x53

B114-145-345V

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 7 of 9)

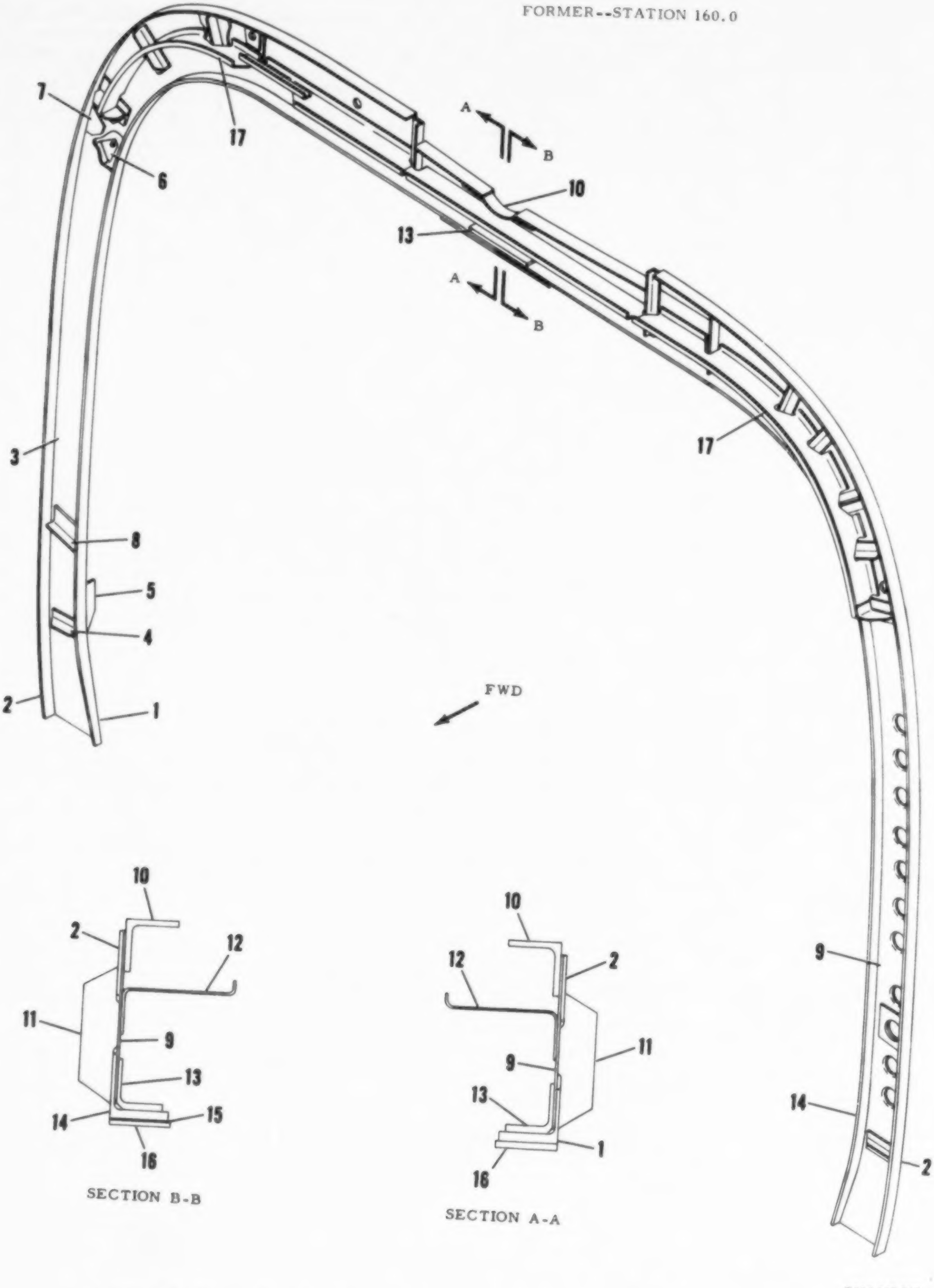

FORMER--STATION 160.0
7
17
6
A
B
10
13
A
B
3
17
8
5
4
2
1
FWD
9
14
2
10
2
12
11
9
13
14
15
16
SECTION B-B
10
12
2
11
9
13
1
16
SECTION A-A
42x53
B114-146-34S

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 8 of 9)

FORMER--STATION 160.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 60278 7075-T6	0.200 4130	--
2	CAP	ALCOA 16871 7075-T6	0.100 4130	--
3	WEB	0.063 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
4	STIFFENER	ALCOA 27695 7075-T6	0.036 4130	--
5	ANGLE	ALCOA 45827 7075-T6	0.080 4130	--
6	CLIP	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	--
7	DOUBLER	0.063 7075-T6 BARE	0.080 7075-T6 CLAD	--
8	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
9	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
10	ATTACHMENT	7075-T6 FORGING	NOTE B.	--
11	STIFFENER	ALCOA 31543 7075-T6	0.125 4130	--
12	ZEE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
13	SPLICE ANGLE	0.071 301 1/2H CRES	NOTE C.	--
14	CAP	ALCOA 14202 7075-T6	0.160 4130	--
15	FILLER	0.040 301 1/2H CRES	NOTE C.	--
16	SPLICE PLATE	0.063 301 1/2H CRES	NOTE C.	--
17	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--

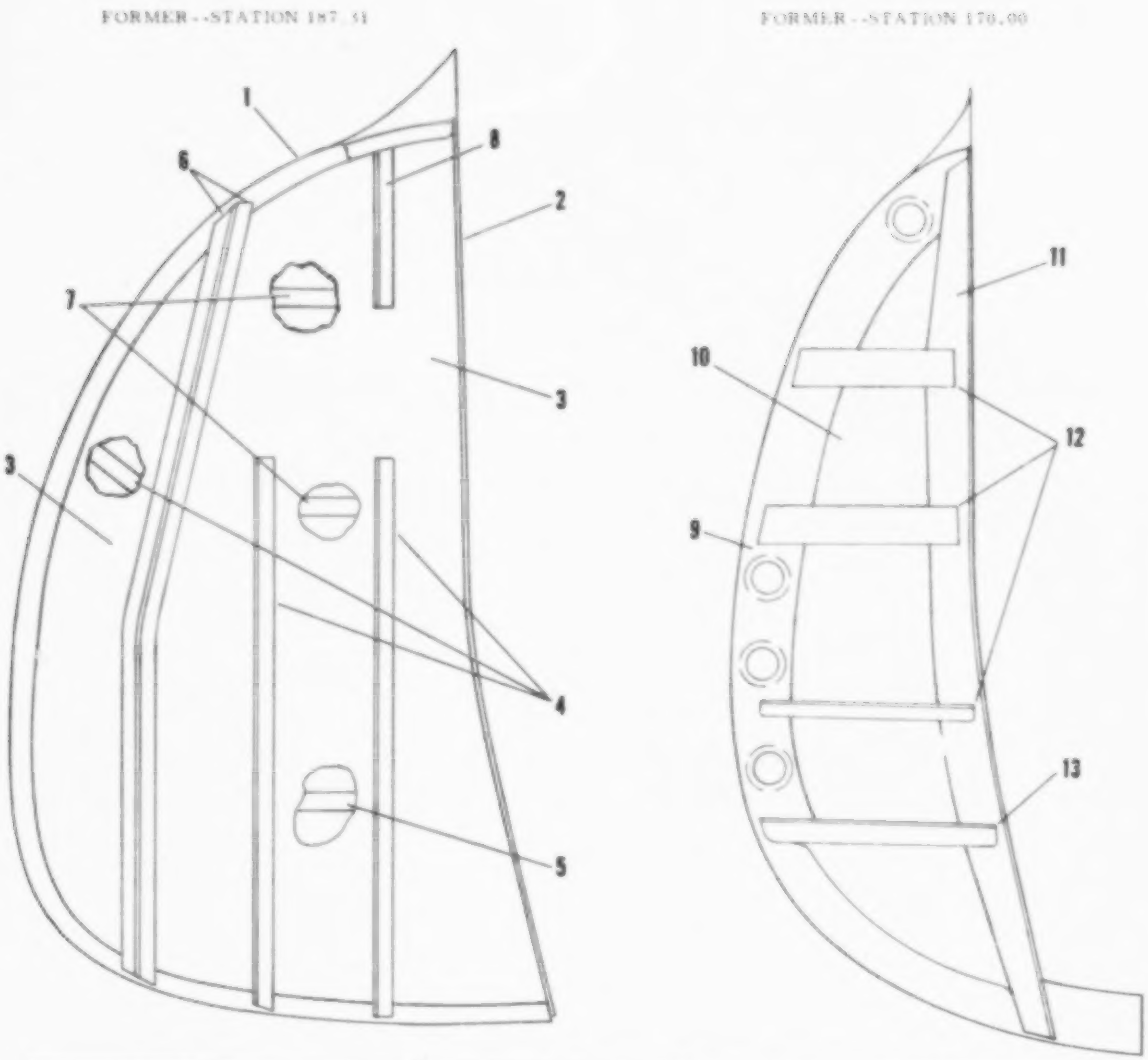
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE ATTACHMENT IF DAMAGE IS OTHER THAN NEGLIGIBLE WITH ATTACHMENT 114S2867-1
C. REPLACE PART IF DAMAGE IS OTHER THAN NEGLIGIBLE WITH A NEW PART SAME AS ORIGINAL

42x32

B114-147-34SV

Figure 2-9. Former Repairs—Cockpit Fuselage Structure Assembly (Sheet 9 of 9)


FORMER--STATION 187.31

FORMER--STATION 170.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 22008 7075-T6	0.071 4130	--
2	ANGLE	ALCOA 22885 7075-T6	0.080 4130	--
3	WEB	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD	2-7
4	SUPPORT	ALCOA 44076 7075-T6	0.063 4130	--
5	SUPPORT	AND10134-1202 7075-T6	0.100 4130	--
6	ANGLE	ALCOA 44076 7075-T6	0.063 4130	--
7	SUPPORT	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
8	ANGLE	ALCOA 28546	0.050 4130	--
9	FORMER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
10	WEB	0.020 2024-T3 CLAD	0.025 2024-T3 CLAD	2-7
11	CAP	REYNOLDS 11730 7075-T6	0.090 4130	--
12	SUPPORT	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
13	SUPPORT	ALCOA 59409 7075-T6	0.063 4130	--

NOTE

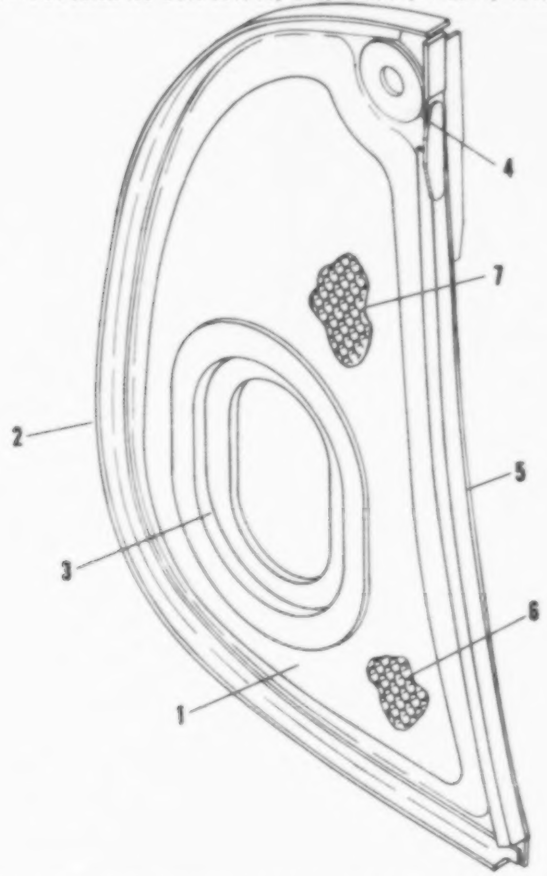
ALL DIMENSIONS ARE IN INCHES

42 X 53

B114-275-345V

Figure 2-10. Former Repairs, Pod Installation—Cabin Fuselage Structure Assembly (Sheet 1 of 4)

FORMER--TYPICAL AT STA 189.41, 238, 262.16, 372.36, 389.91 AND 438.50



SEE SHEET 3 FOR
REPAIRS OF FORMER ON
HELICOPTERS WITH CRASH
RESISTANT FUEL TANKS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	NO. 181 FIBERGLASS, MIL-P-8013, TYPE I	--
*2	CAP	ALCOA 22008 7075-T6	0.071 4130
**	CAP	VS90332 7075-T6	0.071 4130
3	ADAPTER	NOTE B.	--
4	ADAPTER	NOTE C.	--
5	CAP	AND10137-0707 7075-T6	0.063 4130
***6	CORE	0.640, 3.1-3/16-10N 3003	--
****	CORE	0.640, 3.4-1/4-15N 3003	--
7	CORE	0.640, 23.4-1/8-60N 3003	--

*USED AT STATIONS 238, 262.16, 372.36, 389.91, AND 438.5 ONLY
**USED AT STATION 189.41 ONLY
***USED AT STATIONS 189.41, 238, 372.36, 389.91, AND 438.5 ONLY
****USED AT STATION 262.16 ONLY

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE WITH ADAPTER 114S5804-5 AT STATIONS 189.41, 238, 389.91, 372.36 RH, AND 438.5. REPLACE WITH ADAPTER 114S5804-1 AT STATION 262.16 LH; 114S5806-1 AT STATION 262.16 RH; 114S5806-3 AT STATION 372.36 LH

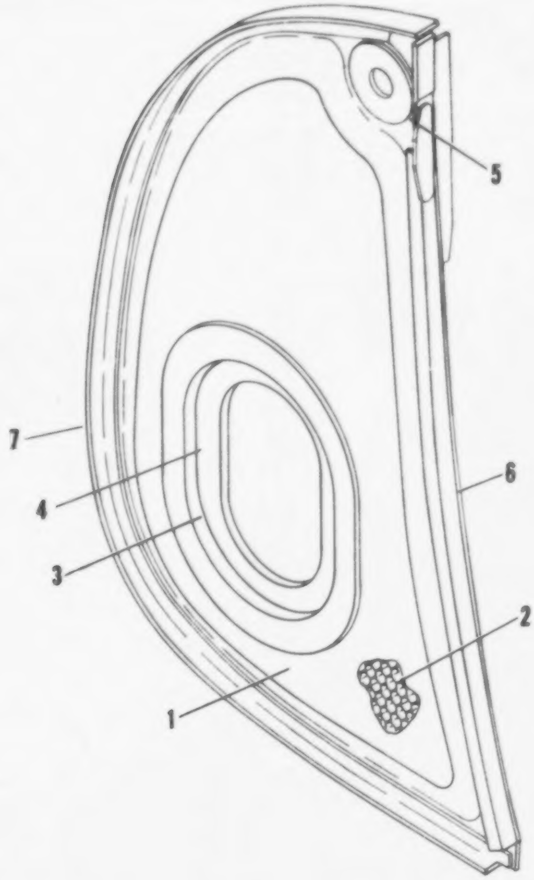
C. REPLACE WITH ADAPTER 114S5809-9 AT STATIONS 189.41 RH, 238 LH, 262.16 RH, 372.36 LH, 389.91 RH, AND 438.5 LH. REPLACE WITH ADAPTER 114S5804-10 AT STATIONS 189.91 LH, 238 RH, 262.16 LH, 372.36 RH, 389.91 LH, AND 438.5 RH

42x53

B114-220-345V

Figure 2-10. Former Repairs, Pod Installation—Cabin Fuselage Structure Assembly (Sheet 2 of 4)

FORMER--TYPICAL AT STA 189.41, 238, 262.16, 372.36, 389.91 AND 438.50



FORMER REPAIRS ON
HELICOPTERS WITH CRASH
RESISTANT FUEL TANKS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	7075-T6 CLAD	--
*2	CORE	0.640, 3.1-3/16-10N 3003	--
**	CORE	0.640, 3.4-1/4-15N 3003	--
3	ADAPTER	NOTE B.	--
4	ADAPTER	NOTE C.	--
5	ADAPTER	NOTE D.	--
6	CAP	AND10137-0707 7075-T6	0.063 4130
***7	CAP	ALCOA 22008 7075-T6	0.071 4130
****	CAP	VS90332 7075-T6	0.071 4130

*USED AT STATIONS 189.41, 238, 372.36, 389.91 AND 438.50 ONLY
**USED AT STATIONS 262.16 ONLY
***USED AT STATIONS 238, 262.16, 372.36, 389.91, AND 438.5 ONLY
****USED AT STATIONS 189.41 ONLY

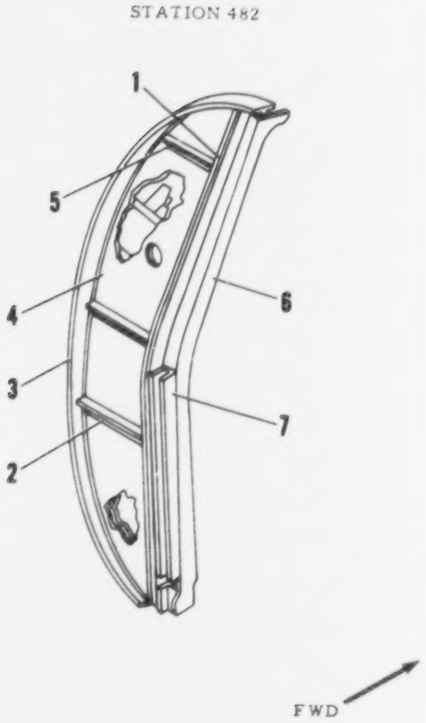
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH ADAPTER 114S5836-2
C. REPLACE WITH ADAPTER 114S5831-1
D. REPLACE WITH ADAPTER 114S5838-1

42X54

B114-614 34SV

Figure 2-10. Former Repairs, Pod Installation—Cabin Fuselage Structure Assembly (Sheet 3 of 4)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	ANGLE	ALCOA 44076 7075-T6	0.063 4130	--
2	STIFFENER	AND 10133-0601 7075-T6	0.071 4130	--
3	CAP	ALCOA 22008 7075-T6	0.071 4130	--
4	WEB	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
5	STIFFENER	AND 10133-0601 7075-T6	0.071 4130 STEEL	--
6	ATTACH MEMBER	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	--
7	CHANNEL	0.063 7075-T6	0.071 7075-T6	--

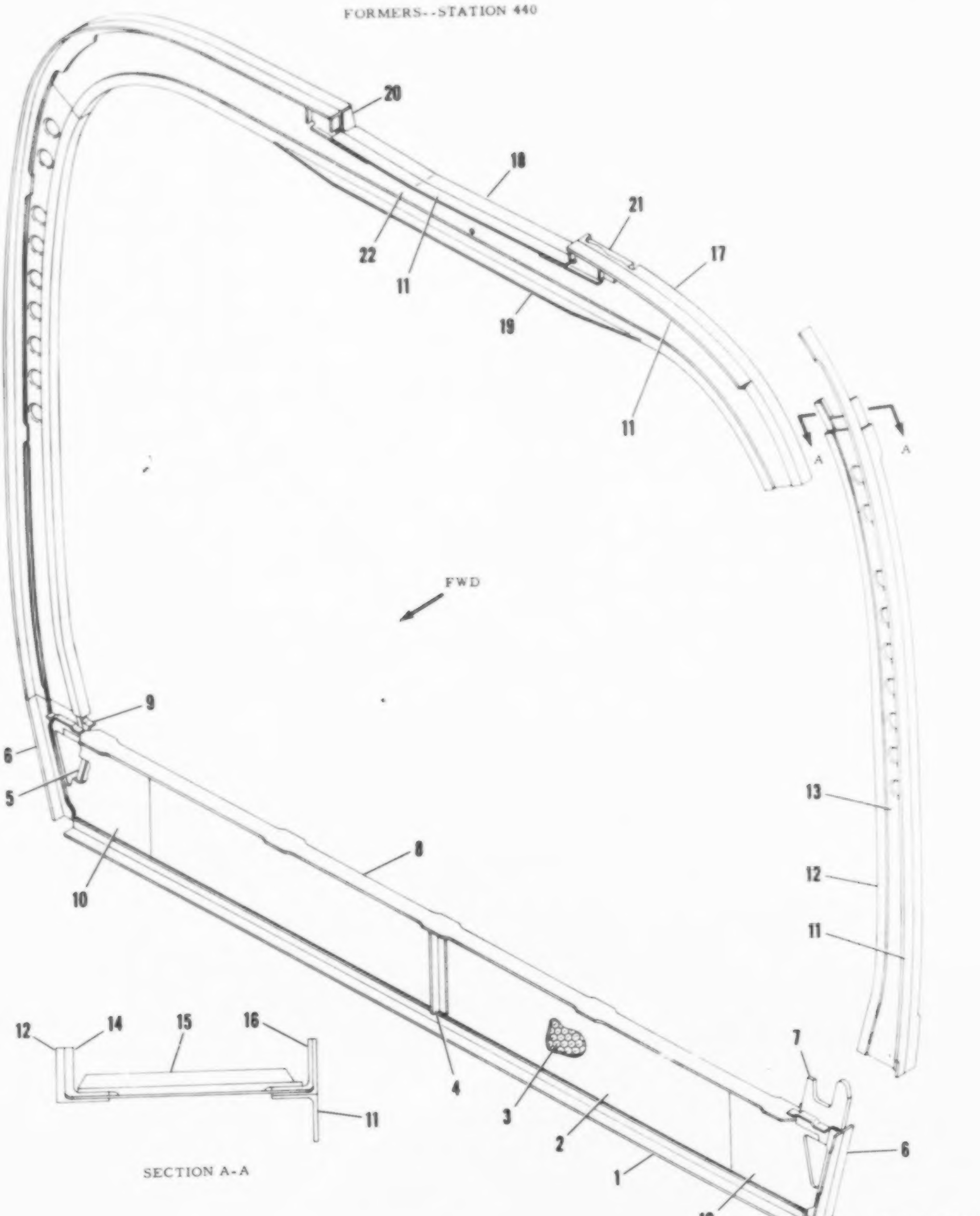
NOTE

ALL DIMENSIONS ARE IN INCHES

42/51

B114-225-34S V

Figure 2-10. Former Repairs, Pod Installation—Cabin Fuselage Structure Assembly (Sheet 4 of 4)


FORMERS--STATION 440
20
18
21
17
22
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19
11
A
A
FWD
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6
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16
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4
3
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2
6
1
SECTION A-A
10
B114-210-355

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 21)

FORMERS--STATION 440.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	VS90111 7075-T6	NOTE B.	--
2	SKIN	0.020 7075-T6	NOTE B.	--
3	CORE	0.255 3.0 3/8 20N-3003	NOTE B.	--
4	ANGLE	ALCOA 62564 7075-T6	0.080 4130	--
5	ANGLE	AND 10133-0601 7075-T6	0.071 4130	--
6	CAP	VS90110 7075-T6	0.090 4130	--
7	ATTACHMENT	0.250 7075-T6 BARE	NOTE B.	--
8	CAP	VS90302 7075-T6	NOTE B.	--
9	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
10	DOUBLER	0.050 7075-T6	NOTE B.	--
11	CAP	VS90110 7075-T6	0.090 4130	--
12	CAP	VS90112 7075-T6	0.190 4130	--
13	WEB	0.040 2024-T3 CLAD	0.060 2024-T3 CLAD	--
14	SPLICE	VS90112 7075-T6	0.190 4130	--
15	DOUBLER	ALCOA 44132 7075-T6	0.100 4130	--
16	SPLICE	VS90110 7075-T6	0.090 4130	--
17	CAP	ALCOA 13816 7075-T6	0.100 4130	--
18	CAP	VS90114 7075-T6	0.190 4130	--
19	CAP	VS90313 7075-T6	0.190 4130	--
20	ATTACHMENT	2014-T6 FORGING	NOTE C.	--
21	ATTACHMENT	2014-T6 FORGING	NOTE D.	--
22	WEB	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	2-7

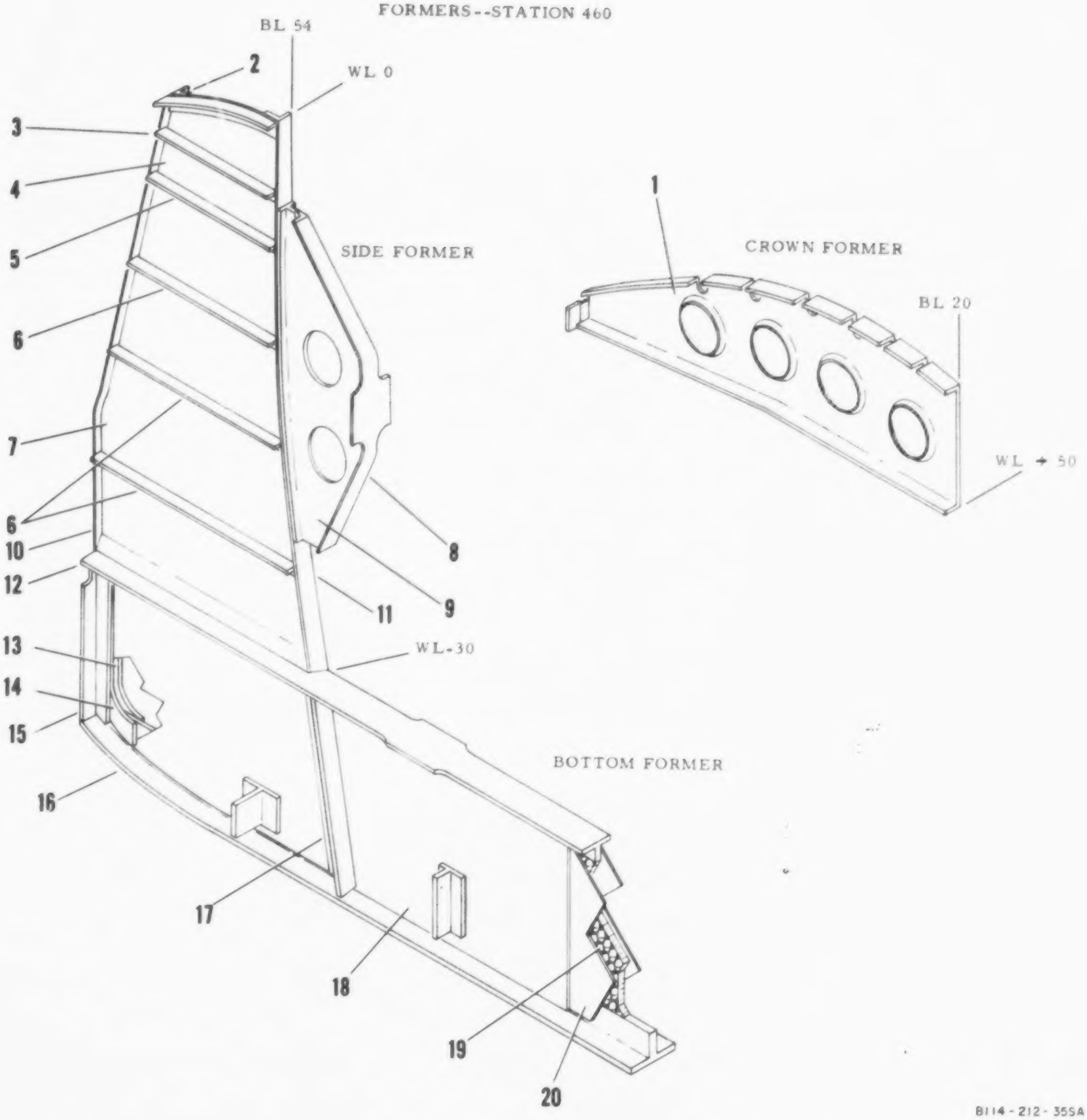
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. COMPONENT OF BONDED ASSEMBLY, REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIR OF SANDWICH-HONEYCOMB STRUCTURES
C. REPLACE WITH NEW ATTACHMENT 114S3830-5
D. REPLACE WITH NEW ATTACHMENT 114S3829-1

42x32

B114-211-34SV

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 21)


FORMERS--STATION 460
BL 54
2
WL 0
3
4
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16
17
18
19
20
1
SIDE FORMER
CROWN FORMER
BL 20
WL + 50
8
9
11
WL-30
BOTTOM FORMER
B114-212-355A

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 21)

FORMERS -- STATION 460.0

CROWN FORMER

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7

SIDE FORMERS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
2	ANGLE	AND10133-1001 7075-T6	0.071 4130	--
3	STIFFENER	ALCOA 5401 7075-T6	0.071 4130	--
4	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
5	STIFFENER	ALCOA 22878 7075-T6	0.071 4130	--
6	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
7	WEB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
8	CAP	AND10136-1601 7075-T6	0.100 4130	--
9	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
10	CAP	AND10133-1001 7075-T6	0.063 4130	--
11	CAP	ALCOA 67576 7075-T6	0.160 4130	--

BOTTOM FORMER

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
12	CAP	VS90306 7075-T6	0.125 4130	--
13	DOUBLER	0.050 7075-T6 CLAD	0.050 7075-T6 CLAD	--
14	DOUBLER	0.032 7075-T6	0.040 7075-T6 CLAD	--
15	ANGLE	ALCOA 22892 7075-T6	0.100 4130	--
16	CAP	VS90303 7075-T6	0.125 4130	--
17	ANGLE	AND10133-1002 7075-T6	0.100 4130	--
18	DOUBLER	0.032 7075-T6	0.040 7075-T6 CLAD	2-7
19	CORE	0.255 3.0-3/8-20N-3003	NOTE C.	--
20	SKIN	0.020 7075-T6	NOTE C.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE LH FORMERS ARE SHOWN, THE RH FORMERS ARE SIMILAR IN CONSTRUCTION, THE MATERIALS LISTED ARE APPLICABLE TO THE LH AND RH CONFIGURATIONS

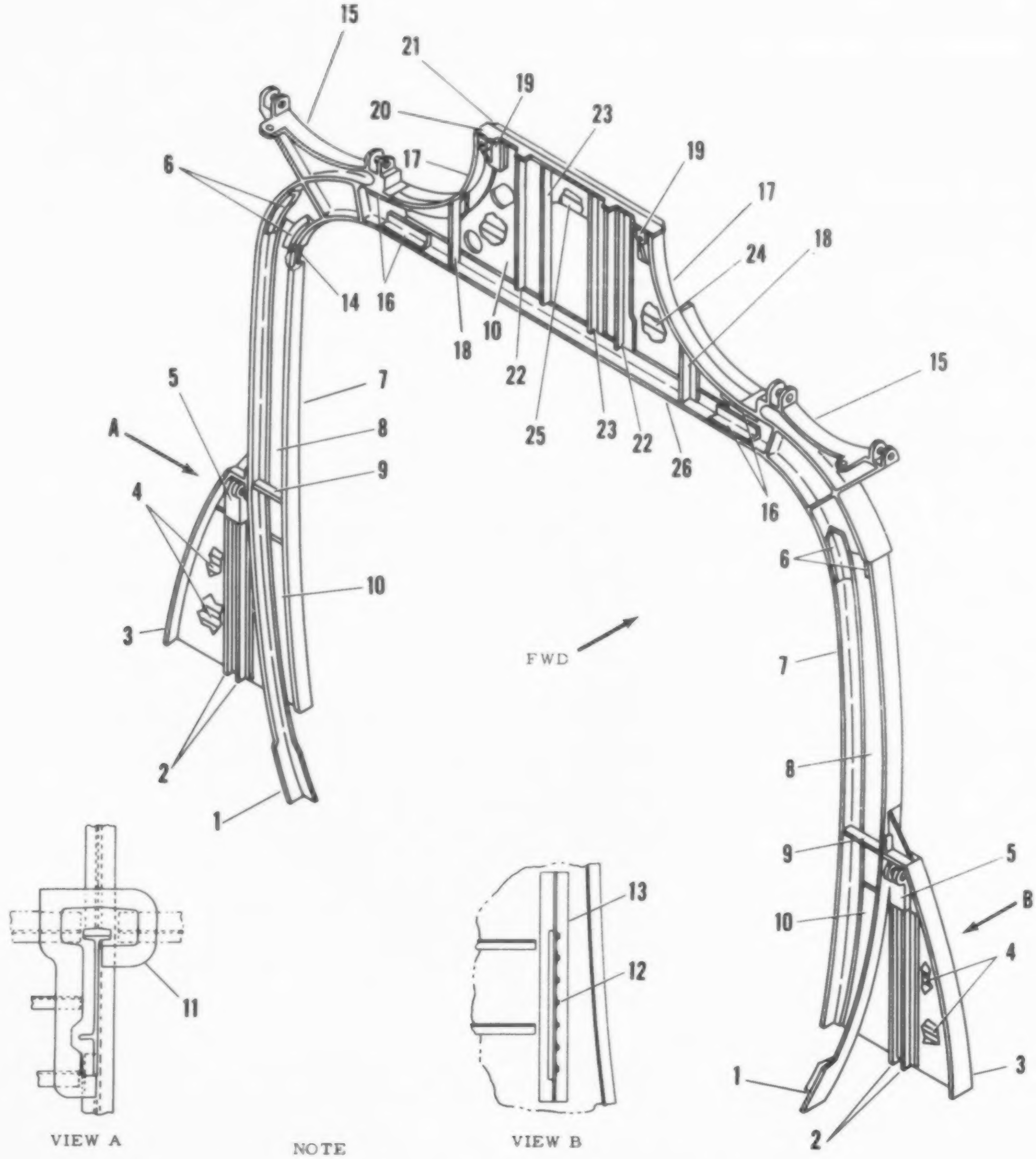
C. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIR OF SANDWICH HONEYCOMB STRUCTURES

42x42

B114-213-345V

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 4 of 21)

FORMER--STATION 482.0


15
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A
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25
23
22
26
15
9
4
16
6
10
3
FWD
7
2
8
1
9
5
B
10
4
13
12
11
1
3
2
VIEW A
VIEW B

NOTE

SEE SHEET 7 FOR BOTTOM FORMER-STATION 482.0

42x51

B114-214-34SR

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 5 of 21)

FORMER -- STATION 482.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 51994 7075-T6	0.160 4130	--
2	STIFFENER	AND10136-2407 7075-T6	0.125 4130	--
3	CAP	REYNOLDS 16908 7075-T6	0.125 4130	--
4	STIFFENER	ALCOA 62564 7075-T6	0.090 4130	--
5	FITTING	2014-T6	NOTE B.	--
6	SPLICE ANGLE	0.125 301 1/4H CRES	0.125 301 1/4H CRES	--
7	CAP	ALCOA 51994 7075-T6	0.160 4130	--
8	WEB	0.071 2024-T3 CLAD	0.080 2024-T3 CLAD	2-7
9	STIFFENER	ALCOA 59810 7075-T6	0.250 4130	--
10	WEB	0.063 7075-T6 BARE	0.080 7075-T6 CLAD	2-7
11	DOUBLER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
12	CAP	AND10134-1407 7075-T6	0.125 4130	--
13	TEE	AND10136-2407 7075-T6	0.125 4130	--
14	STRAP	0.125 301 3/4H CRES	0.125 301 3/4H CRES	--
15	FITTING	2014-T6	NOTE D.	--
16	SPLICE ANGLE	AND10134-1604 7075-T6	0.160 4130	--
17	CAP	AND10134-2008 7075-T6	0.190 4130	--
18	STIFFENER	REYNOLDS 9097 7075-T6	0.375 4130	--
19	FITTING	2014-T6	NOTE E.	--
20	CAP	ALCOA 16871 7075-T5	0.100 4130	--
21	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
22	STIFFENER	AND10134-1602 7075-T6	0.125 4130	--
23	STIFFENER	AND10134-1408 7075-T6	0.160 4130	--
24	STIFFENER	AND10134-2008 7075-T6	0.190 4130	--
25	STIFFENER	ALCOA 33811 7075-T6	0.125 4130	--
26	CAP	ALCOA 44132 7075-T6	0.190 4130	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH A NEW FITTING 114S3807-1 LH OR -2 RH

C. INSULATE DISSIMILAR METALS AS DIRECTED IN PARA 2-619

D. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE FITTING WITH NEW FITTING 114S3817-39 LH OR -41 RH

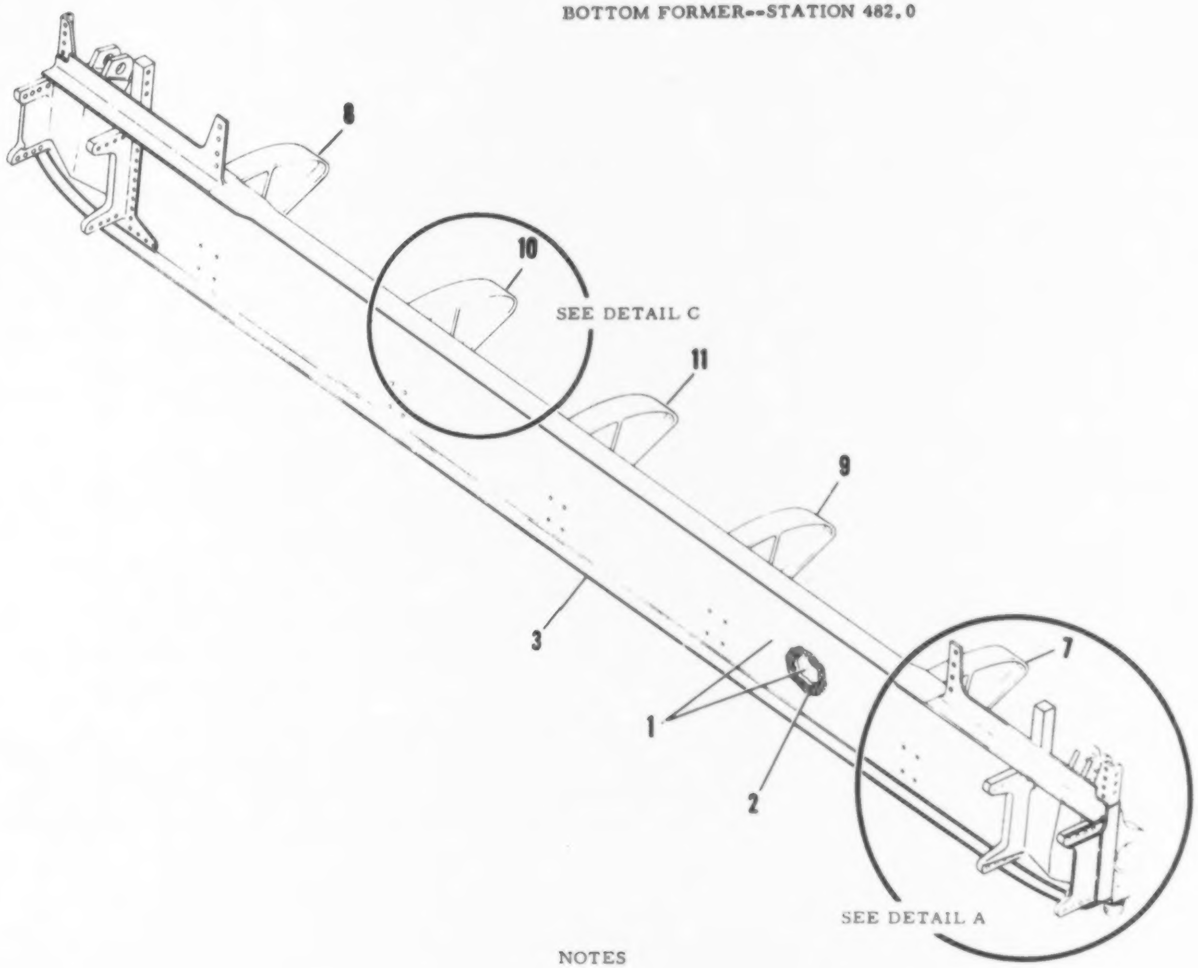
E. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW FITTING 114S3848-19 LH OR -21 RH

42 x 39

B114-215-34SV

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 6 of 21)

BOTTOM FORMER--STATION 482.0



NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. COMPONENT OF A BONDED ASSEMBLY, REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIR OF SANDWICH HONEYCOMB STRUCTURES
C. FOR DAMAGE OTHER THAN NEGLIBLE REPLACE TRUNNION ASSEMBLY WITH A NEW PART 114S3849-1 LH OR -2 RH
D. FOR DAMAGE OTHER THAN NEGLIGIBLE REPLACE HINGE ASSEMBLY WITH A NEW PART 114S3812-41 LH OR -42 RH
E. FOR DAMAGE OTHER THAN NEGLIGIBLE REPLACE HINGE ASSEMBLY WITH A NEW PART 114S3812-22
F. FOR DAMAGE OTHER THAN NEGLIGIBLE REPLACE HINGE WITH A NEW PART 114S3812-13

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	0.036 7075-T6	NOTE B.
2	CORE	3.0-3/8-20-N-3003	NOTE B.
3	CAP	VS90310 7075-T6	NOTE B.
4	CAP	VS90523 7075-T6	NOTE B.
5	BLOCK	0.400 7075-T6 BARE	NOTE B.
6	TRUNNION ASSY	2014-T6	NOTE C.
7	HINGE ASSY	MAGNESIUM ZK 60A-T5	AL ALY 7075-T73 NOTE D.
8	HINGE ASSY	MAGNESIUM ZK 60A-T5	AL ALY 7075-T73 NOTE D.
9	HINGE ASSY	MAGNESIUM ZK 60A-T5	NOTE E.
10	HINGE ASSY	MAGNESIUM ZK 60A-T5	NOTE E.
11	HINGE	MAGNESIUM ZK 60A-T5	NOTE F.

42 x 54

B114-216-345V

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 7 of 21)

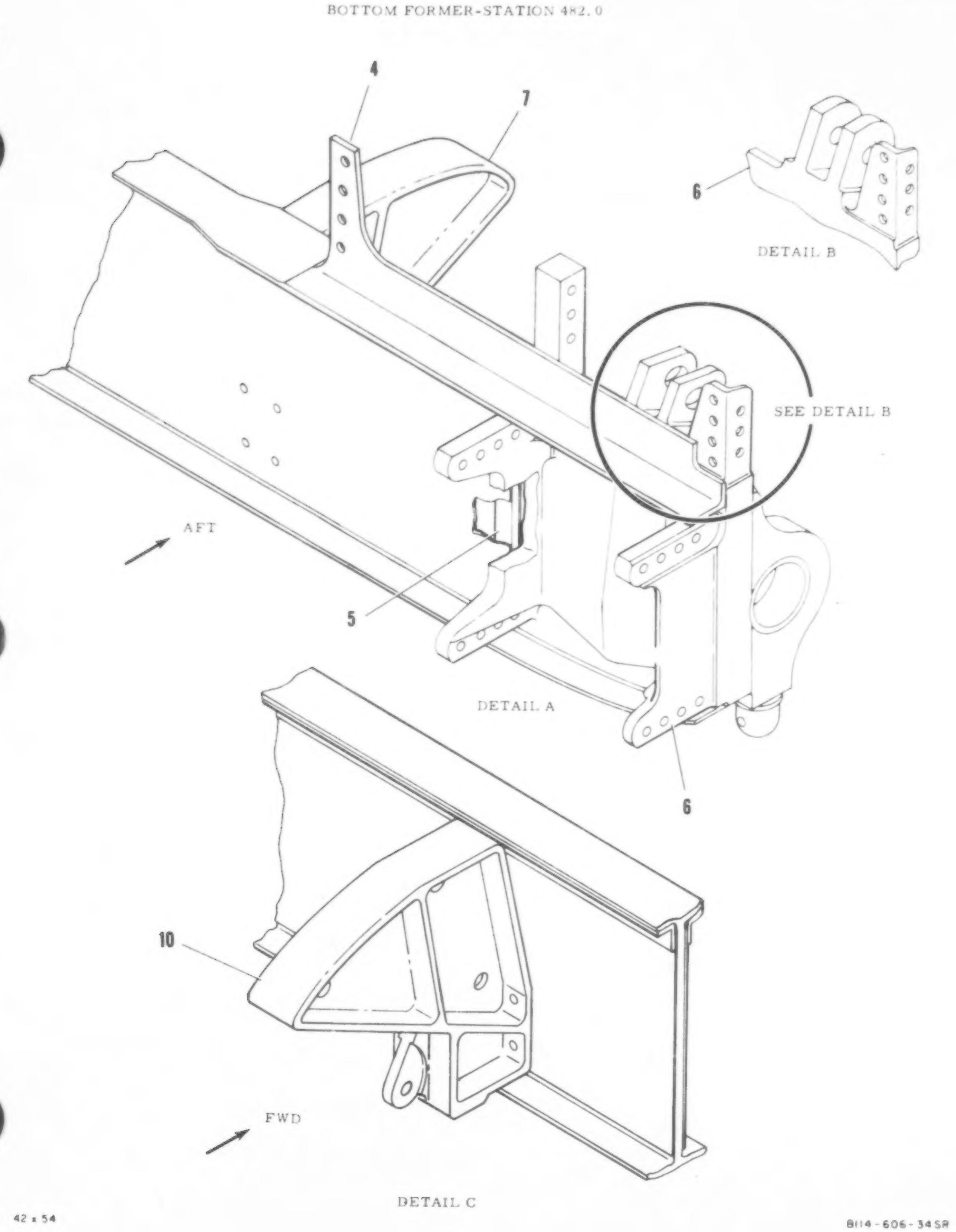
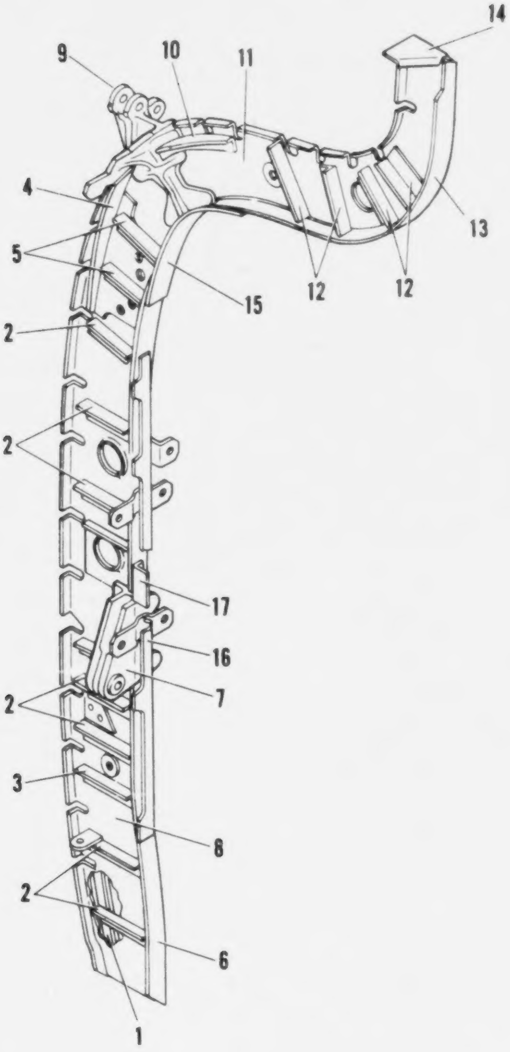

BOTTOM FORMER-STATION 482.0
4
7
6
DETAIL B
SEE DETAIL B
AFT
5
DETAIL A
6
10
FWD
DETAIL C
42 x 54
B114-606-34SR

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 8 of 21)

FORMERS--STATION 502.437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2
2
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16
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2
3
8
2
6
1

B114-217-355

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 9 of 21)

FORMERS--STATION 502.437

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	AND10134-1408 7075-T6	0.160 4130	--
2	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
3	STIFFENER	ALCOA 67580 7075-T6	0.063 4130	--
4	ANGLE	AND10134-1408 7075-T6	0.160 4130	--
5	STIFFENER	VS90112 7075-T6	0.190 4130	--
6	CAP	AND10136-2002 7075-T6	0.100 4130	--
7	FITTING	VS90530 7075-T6	NOTE B.	--
8	WEB	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
9	FITTING	2014-T6	NOTE C.	--
10	ANGLE	AND10134-1406 7075-T6	0.100 4130	--
11	WEB	0.050 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
12	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
13	CAP	HARVEY 15152 7075-T6	0.071 4130	--
14	BRACKET	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	--
15	STRAP	0.100 CRES 301 1/4 H	0.100 CRES 301 1/4 H	2-7
16	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
17	CLIP	ALCOA 61971 7075-T6	0.050 4130	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH A NEW FITTING 1148816-1 LH OR -2 RH

C. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE FITTING WITH NEW FITTING 11483819-39 LH OR -41 RH

D. THE LH FORMER IS SHOWN. THE RH FORMER IS SIMILAR IN CONSTRUCTION. THE ORIGINAL AND REPAIR MATERIALS LISTED ARE APPLICABLE TO LH AND RH CONFIGURATIONS

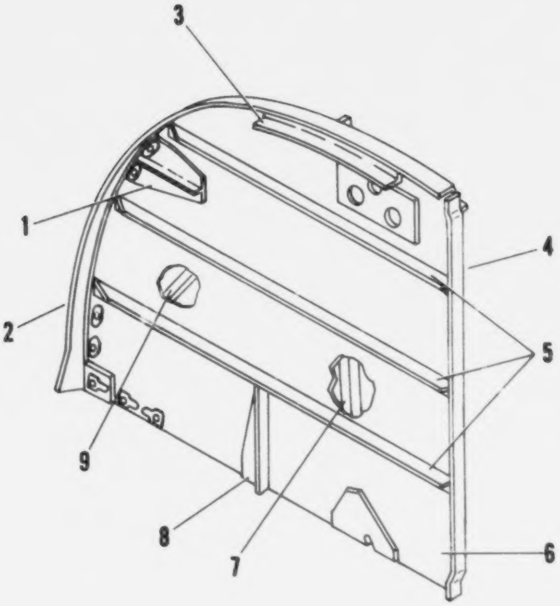
42×28

B114 218 34S V

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 10 of 21)

best copy available

FORMERS--STATION 520.0



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STIFFENER	AND10136-3001 7075-T6	0.125 4130	--
2	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
3	ANGLE	0.040 7075-T6 BARE	0.040 4130	--
4	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
5	STIFFENER	ALCOA 22526 7075-T6	0.063 4130	--
6	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
7	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
8	STIFFENER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
9	STIFFENER	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	--

NOTES

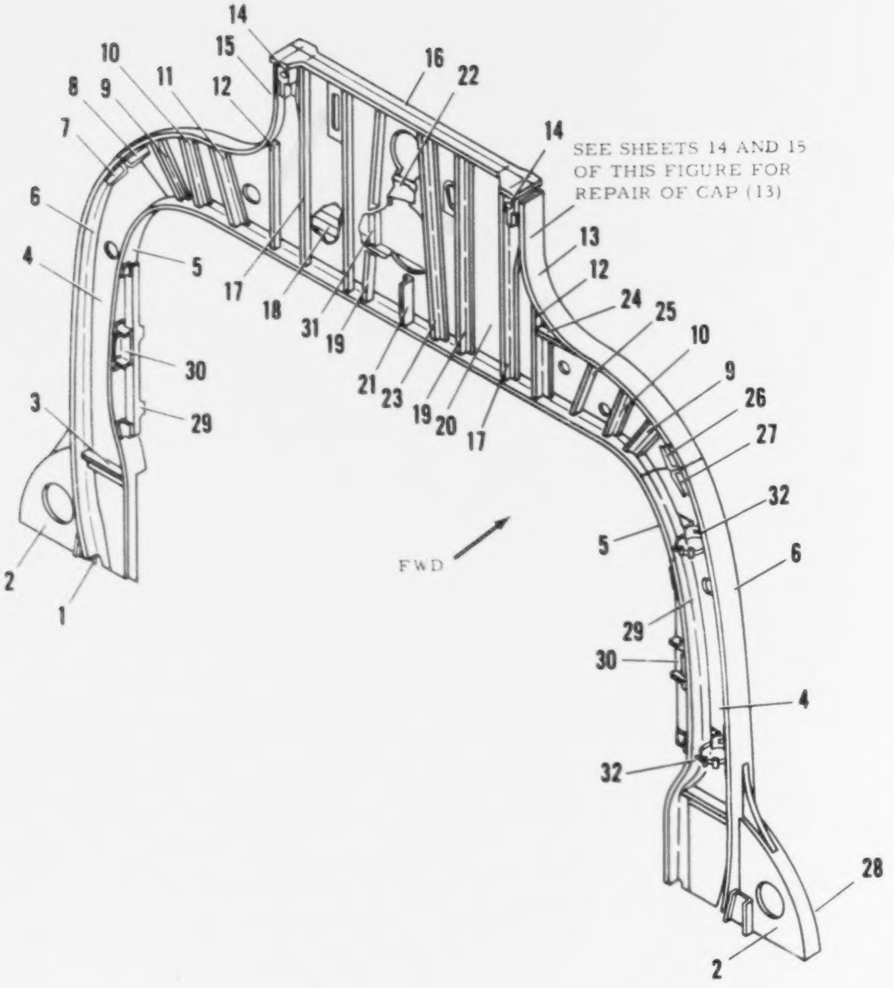
A. ALL DIMENSIONS ARE IN INCHES
B. THE LH FORMER IS SHOWN. THE RH FORMER IS SIMILAR IN CONSTRUCTION. THE ORIGINAL AND REPAIR MATERIALS LISTED ARE APPLICABLE TO LH AND RH CONFIGURATIONS

42x51

B114-219-345V

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 11 of 21)

FORMERS--STATION 534.0


14
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31
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12
24
25
10
30
3
29
21
23
19
20
17
9
26
27
32
2
1
FWD
5
6
29
30
4
32
28
2

SEE SHEETS 14 AND 15 OF THIS FIGURE FOR REPAIR OF CAP (13)

42x41

B114-220-345V

Figure 2-11. Former Repairs--Aft Fuselage Structure Assembly (Sheet 12 of 21)

FORMERS--STATION 534.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	REINFORCEMENT	0.080 7075-T6 CLAD	0.090 7075-T6 CLAD	--
2	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
3	STIFFENER	AND10133-0601 7075-T6	0.071 4130	--
4	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
5	CAP	ALCOA 43774 7075-T6	0.100 4130	--
6	CAP	ALCOA 43774 7075-T6	0.100 4130	--
7	FITTING	2014-T6	NOTE B.	--
8	FITTING	2014-T6	NOTE C.	--
9	STIFFENER	AND10136-1401 7075-T6	0.071 4130	--
10	STIFFENER	AND10136-1401 7075-T6	0.071 4130	--
11	STIFFENER	ALCOA 9484-T6	0.100 4130	--
12	STIFFENER	AND10134-1006 7075-T6	0.100 4130	--
13	CAP	ALCOA 45774 7075-T6	0.100 4130	--
14	FITTING	2014-T6	NOTE D.	--
15	CAP	ALCOA 43774 7075-T6	0.100 4130	--
16	CAP	ALCOA 33495 7075-T6	0.080 4130	--
17	STIFFENER	ALCOA 66017 7075-T6	0.100 4130	--
18	STIFFENER	ALCOA 9484 7075-T6	0.080 4130	--
19	STIFFENER	ALCOA 9484 7075-T6	0.080 4130	--
20	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
21	STIFFENER	ALCOA 9484 7075-T6	0.080 4130	--
22	STIFFENER	0.063 7075-T6 BARF	0.080 4130	--
23	CAP	VS90312 7075-T6	0.100 4130	--
24	STIFFENER	AND10134-1006 7075-T6	0.100 4130	--
25	STIFFENER	AND10134-1006 7075-T6	0.100 4130	--
26	FITTING	2014-T6	NOTE C.	--
27	FITTING	2014-T6	NOTE B.	--
28	CAP	ALCOA 22477 7075-T6	0.050 4130	--
29	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
30	BRACKET	0.050 2024-T4 CLAD	0.050 2024-T3 CLAD	--
31	ANGLE	ALCOA 52735 7075-T6	4130	--
32	□ BRACKET	5-PLY NO. 181 GLASS CLOTH	NOTE E.	--
	△ BRACKET	0.050 301 CRES	0.050 301 CRES	--

□ USED ON HELICOPTERS 66-19098 THROUGH 67-18461

△ USED ON HELICOPTERS 67-18462 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE WITH NEW FITTING 114S3825-13 AND -17 (AFT AND FWD LH RESPECTIVELY) OR -15 AND -19 (AFT AND FWD RH RESPECTIVELY)

C. REPLACE WITH NEW FITTING 114S3825-21 AND -23 (AFT AND FWD LH RESPECTIVELY) OR -22 AND -24 (AFT AND FWD RH RESPECTIVELY)

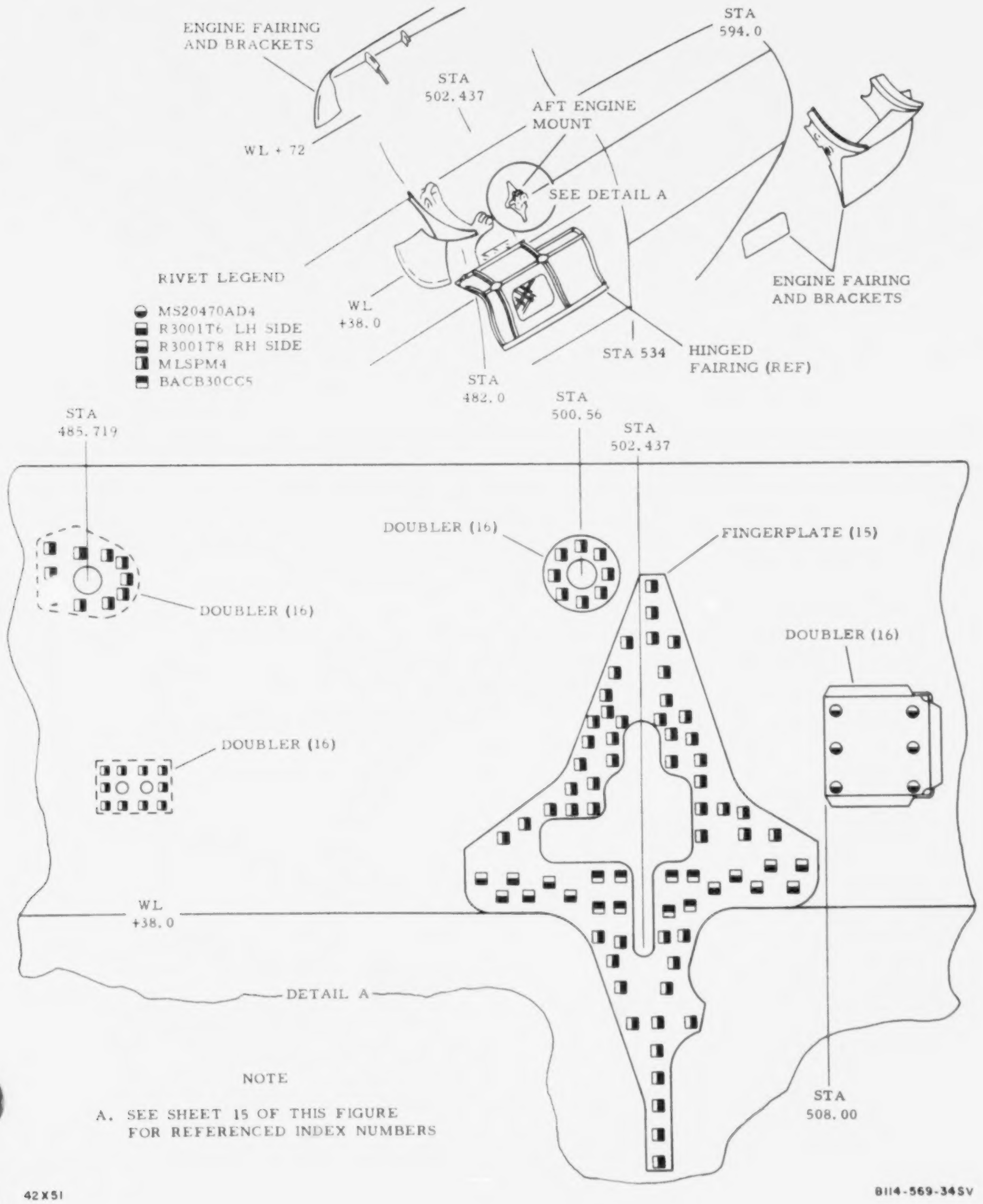
D. REPLACE WITH NEW FITTING 114S3848-11 AND -17 (AFT AND FWD LH RESPECTIVELY) OR -13 AND -15 (AFT AND FWD RH RESPECTIVELY)

E. REPLACE DAMAGED BRACKETS. REFER TO PARA 2-33

B114-268-345V

42x45

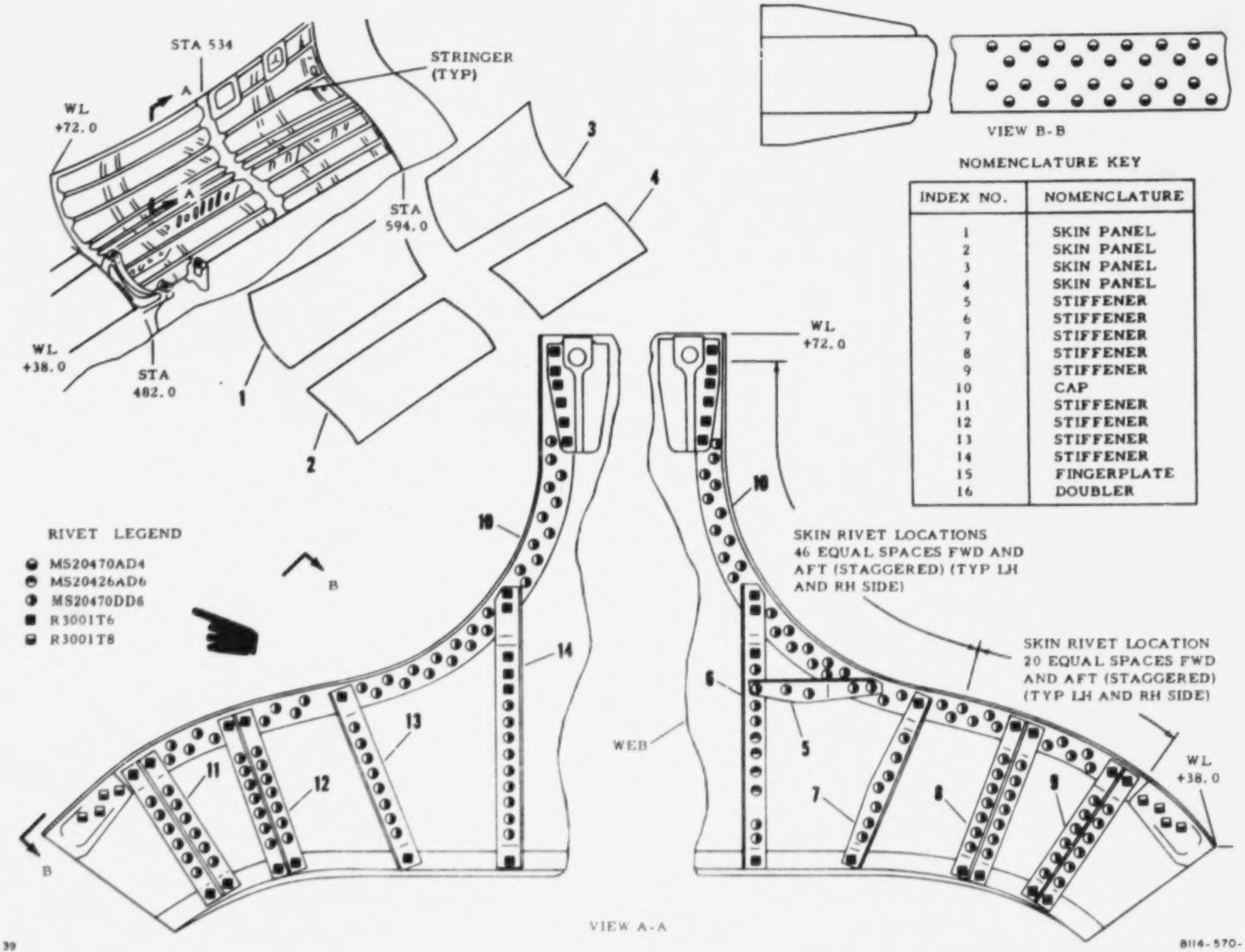
Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 13 of 21)


ENGINE FAIRING AND BRACKETS
STA 594.0
STA 502.437
AFT ENGINE MOUNT
WL + 72
SEE DETAIL A
RIVET LEGEND
◓ MS20470AD4
▤ R3001T6 LH SIDE
▤ R3001T8 RH SIDE
◨ MLSPM4
▬ BACB30CC5
WL +38.0
ENGINE FAIRING AND BRACKETS
STA 534
HINGED FAIRING (REF)
STA 482.0
STA 500.56
STA 502.437
STA 485.719
DOUBLER (16)
FINGERPLATE (15)
DOUBLER (16)
DOUBLER (16)
DOUBLER (16)
WL +38.0
DETAIL A
STA 508.00
42X51
8114-569-34SV

NOTE

A. SEE SHEET 15 OF THIS FIGURE FOR REFERENCED INDEX NUMBERS

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 14 of 21)


STA 534
STRINGER (TYP)
WL +72.0
A
A
STA 594.0
3
4
WL +38.0
STA 482.0
1
2
VIEW B-B
WL +72.0
10
10
B
14
13
12
11
B
6
5
7
8
9
WEB
WL +38.0
VIEW A-A

SKIN RIVET LOCATIONS
46 EQUAL SPACES FWD AND
AFT (STAGGERED) (TYP LH
AND RH SIDE)

SKIN RIVET LOCATION
20 EQUAL SPACES FWD
AND AFT (STAGGERED)
(TYP LH AND RH SIDE)

NOMENCLATURE KEY

INDEX NO.	NOMENCLATURE
1	SKIN PANEL
2	SKIN PANEL
3	SKIN PANEL
4	SKIN PANEL
5	STIFFENER
6	STIFFENER
7	STIFFENER
8	STIFFENER
9	STIFFENER
10	CAP
11	STIFFENER
12	STIFFENER
13	STIFFENER
14	STIFFENER
15	FINGERPLATE
16	DOUBLER

RIVET LEGEND

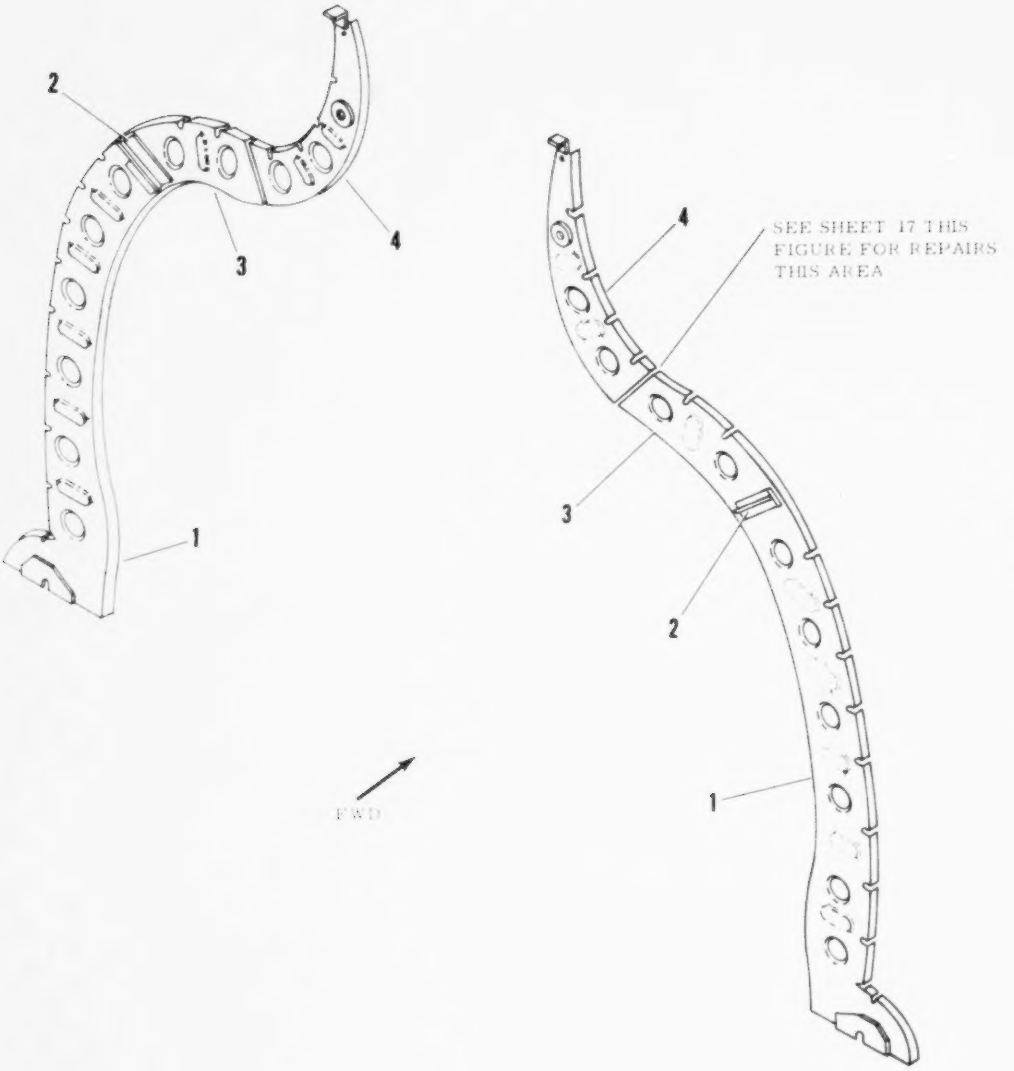
●	MS20470AD4
●	MS20426AD6
◐	MS20470DD6
■	R3001T6
▣	R3001T8

54 x 39

8114-570-345J

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 15 of 21)

FORMERS--STATION 555


2
3
4
1
4
SEE SHEET 17 THIS FIGURE FOR REPAIRS THIS AREA
3
2
1
FWD

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-8
2	FITTING	AND10136-1601 7075-T6	0.100 4130	
3	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-8
4	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-8

NOTE

ALL DIMENSIONS ARE IN INCHES

42 X 51

B114-221-345V

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 16 of 21)

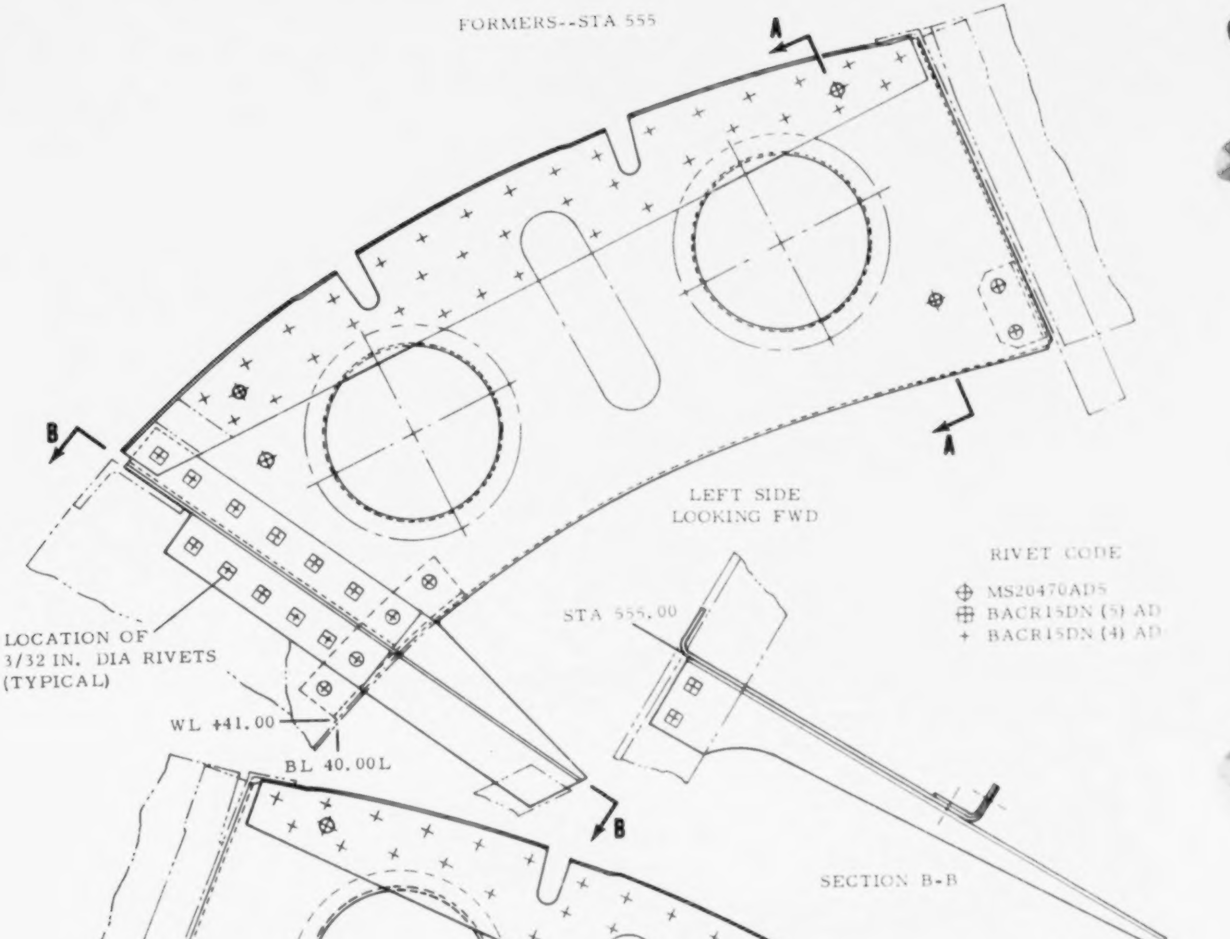
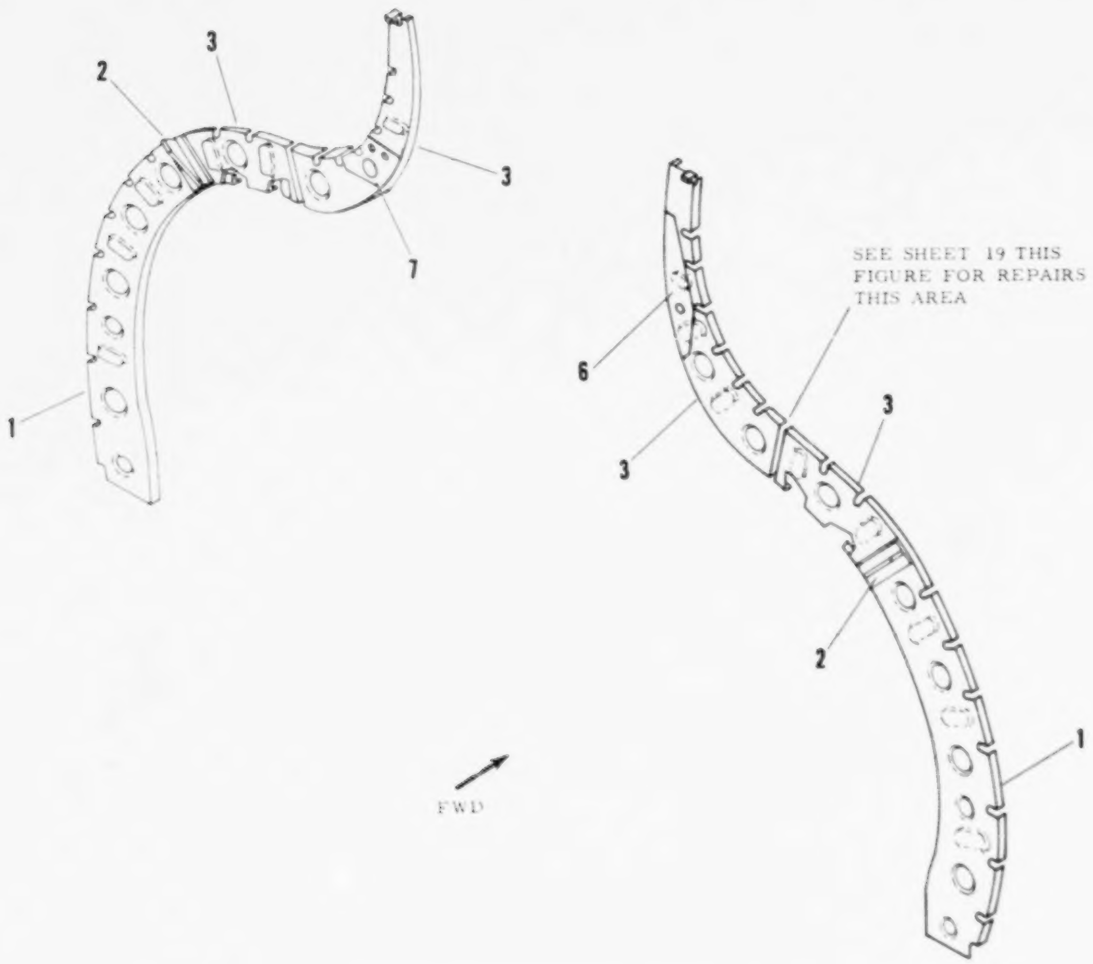

FORMERS--STA 555
A
A
B
LEFT SIDE
LOOKING FWD
RIVET CODE
⊕ MS20470AD5
⊞ BACR15DN (5) AD
+ BACR15DN (4) AD
STA 555.00
LOCATION OF
3/32 IN. DIA RIVETS
(TYPICAL)
WL +41.00
BL 40.00L
B
SECTION B-B
A
STA 555.00
WL +44.84
BL
37.44R
RIGHT SIDE
LOOKING FWD
A
FWD
SECTION A-A
42x54
B114 563 345M

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 17 of 21)

FORMERS--STATION 575.5


3
2
3
7
1
SEE SHEET 19 THIS FIGURE FOR REPAIRS THIS AREA
6
3
3
2
1
FWD

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	WEB	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD
2	TEE	AND 10136-1605 7075-T6	0.100 4130
3	WEB	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD
4	DOUBLER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD
5	ANGLE	0.032 2024-T6 CLAD	0.040 2024-T6 CLAD
6	SUPPORT	0.032 2024-T6 CLAD	0.040 2024-T4 CLAD
7	DOUBLER	0.050 2024-T3 CLAD	0.050 2024-T3 CLAD

NOTE

ALL DIMENSIONS ARE IN INCHES

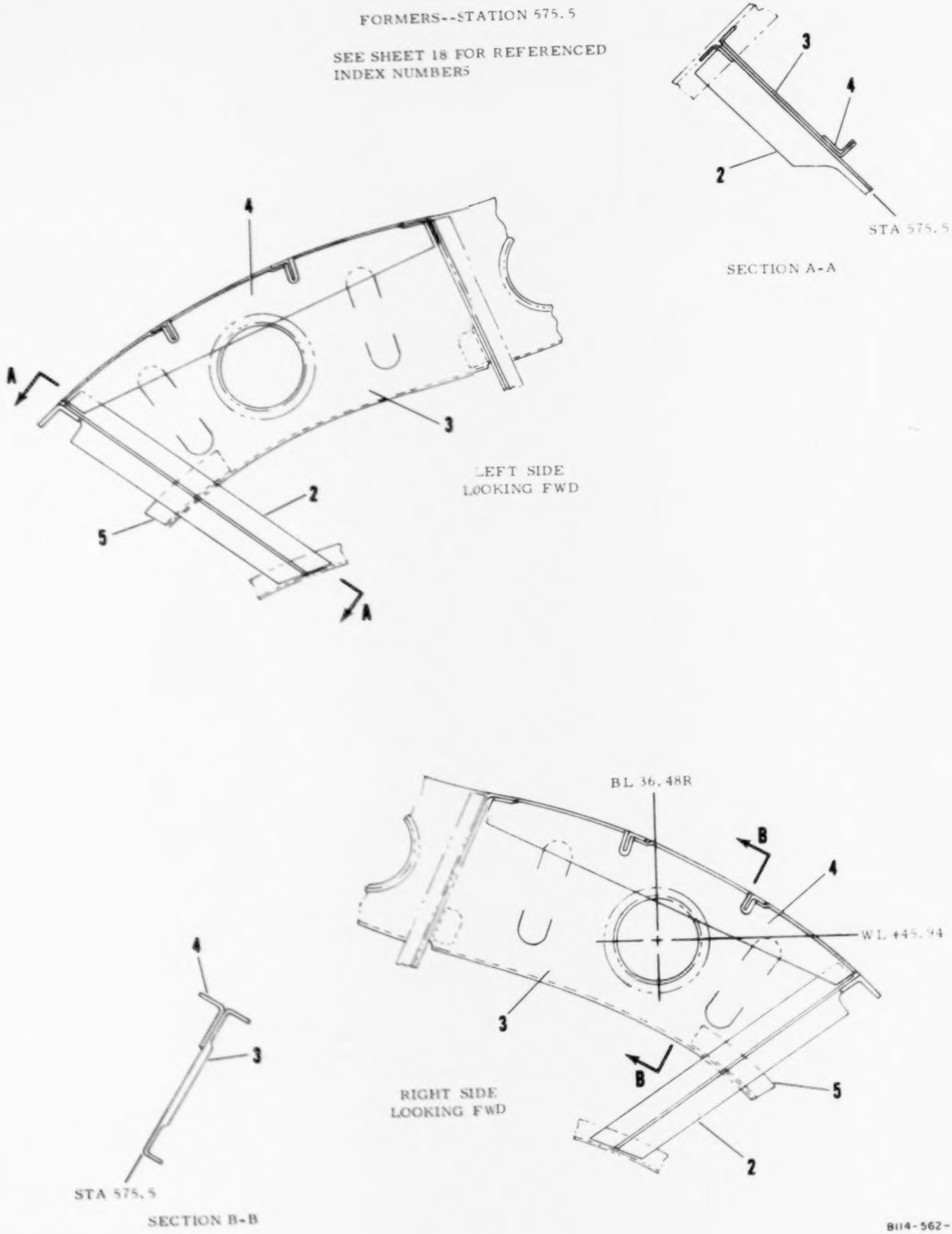
B114-222-345V

42 x 51

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 18 of 21)

FORMERS--STATION 575.5

SEE SHEET 18 FOR REFERENCED INDEX NUMBERS


3
4
2
STA 575.5
4
A
3
2
5
A
BL 36.48R
B
4
WL +45.94
3
B
5
2
4
3
STA 575.5

SECTION A-A

LEFT SIDE LOOKING FWD

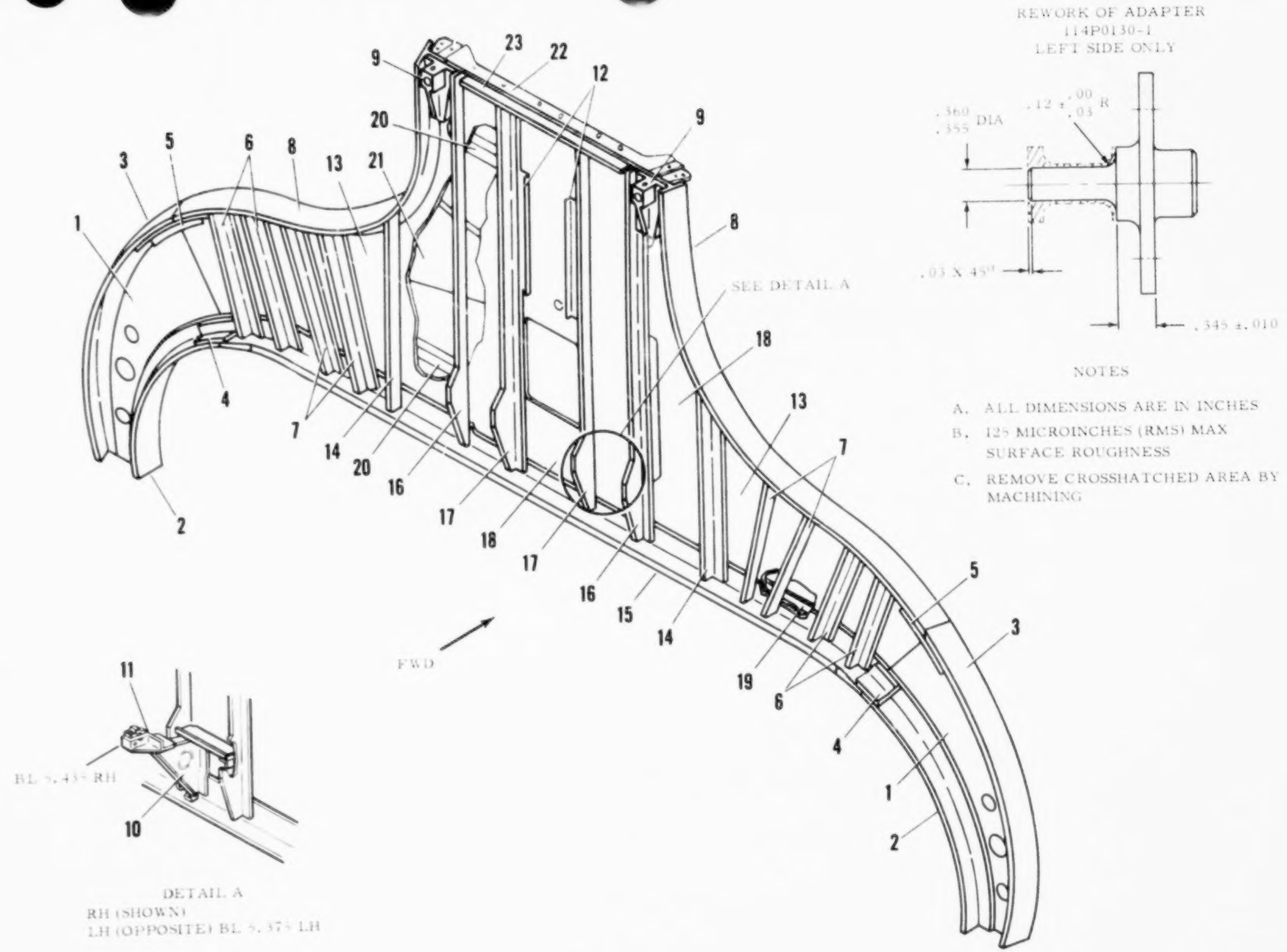
RIGHT SIDE LOOKING FWD

SECTION B-B

B114-562-345V

42 x 54

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 19 of 21)


9
23
22
12
20
9
3
5
6
8
13
21
1
8
SEE DETAIL A
18
4
13
7
7
14
20
16
2
17
18
17
16
15
14
19
6
5
3
4
1
2
FWD
11
BL 5.435 RH
10
DETAIL A
RH (SHOWN)
LH (OPPOSITE) BL 5.375 LH
REWORK OF ADAPTER
114P0130-1
LEFT SIDE ONLY
.360
.355 DIA
.12 ± .00/.03 R
.03 X 45°
.345 ±.010

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. 125 MICROINCHES (RMS) MAX SURFACE ROUGHNESS
C. REMOVE CROSSHATCHED AREA BY MACHINING

54 x 39

B114-223-345N

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 20 of 21)

FORMER--STATION 594

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.050 7075-T6 CLAD	0.050 7075-T6 CLAD	2-7
2	CAP	AND10136-2006 7075-T6	0.125 4130	--
3	CAP	VS90307 7075-T6	0.125 4130	--
4	ANGLE	AND10134-1205 7075-T6	0.100 4130	--
5	ANGLE	VS90307 7075-T6	0.125 4130	--
6	STIFFENER	AND10136-1401 7075-T6	0.071 4130	--
7	STIFFENER	ALCOA 15820 7075-T6	0.080 4130	--
8	CAP	VS90311 7075	0.125 4130	--
9	FITTING	2014-T6	NOTE B.	--
10	BRACKET	0.071 2024-T4 CLAD	0.080 2024-T4	--
11	SUPPORT	--	NOTE C.	--
12	ANGLE	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	--
13	WEB	0.063 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
14	STIFFENER	AND10134-1006 7075-T6	0.100 4130	--
15	CAP	VS90312 7075-T6	0.125 4130	--
16	STIFFENER	0.080 7075-T6 BARE	0.090 7075-T6 CLAD	--
17	STIFFENER	0.063 7075-T6 BARE	0.070 7075-T6 CLAD	--
18	WEB	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	2-7
19	STRAP	0.063 CRES 17-7 PH	0.063 CRES 17-7 PH	2-7
20	STIFFENER	AND10133-0601 7075-T6	--	--
21	CHANNEL	0.072 7075-T6 BARE	0.080 7075-T6 CLAD	--
22	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
23	CAP	ALCOA 33495 7075-T6	0.040 4130	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW FITTING 114S3848-33 OR -35
C. REPLACE WITH NEW SUPPORT 114S3842-1 OR LH OR 114S3842-2 RH. REWORK ADAPTER AS SHOWN

42 x 40

B84-224-34SV

Figure 2-11. Former Repairs—Aft Fuselage Structure Assembly (Sheet 21 of 21)

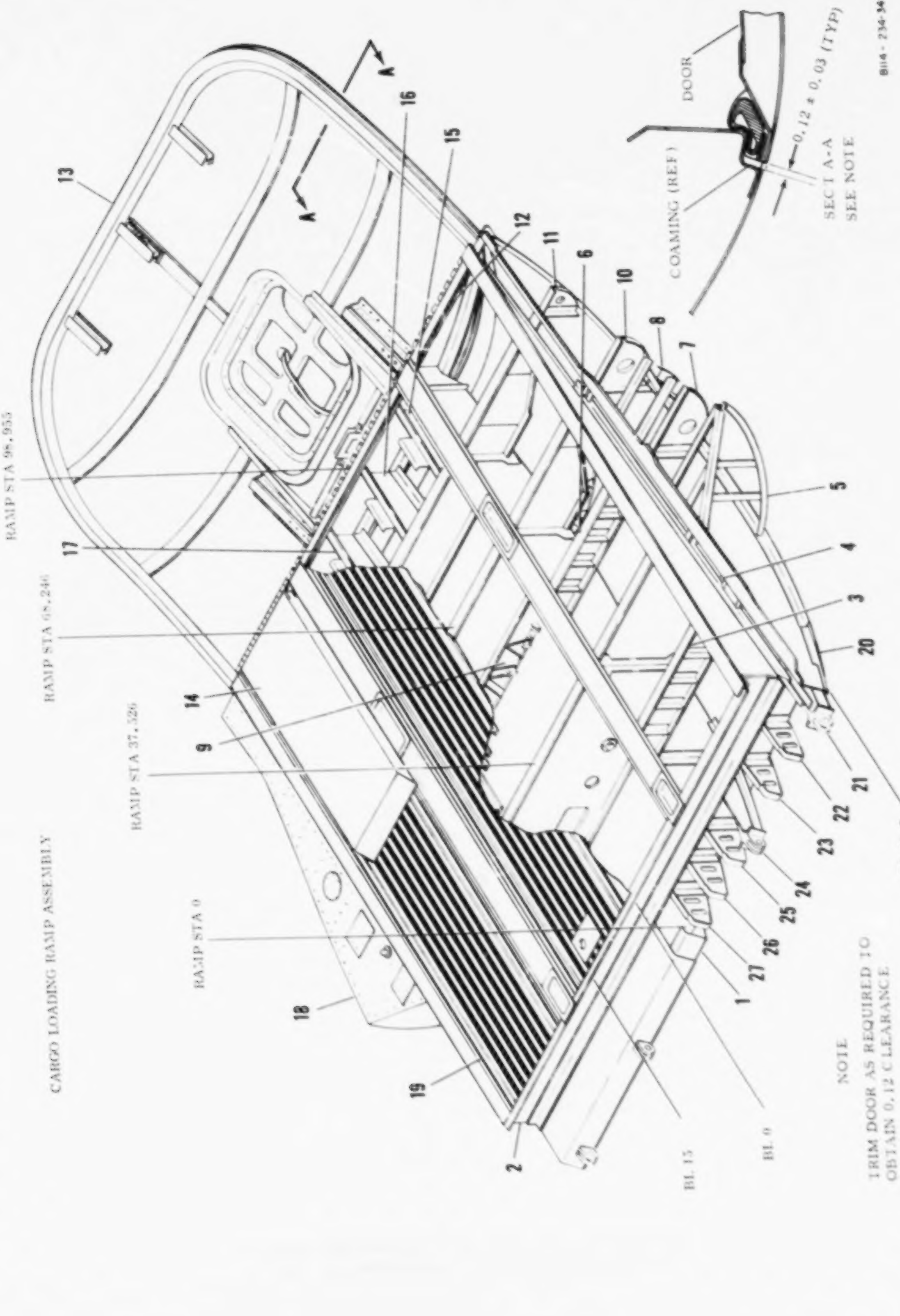

CARGO LOADING RAMP ASSEMBLY
RAMP STA 98.953
RAMP STA 68.246
RAMP STA 37.526
RAMP STA 0
13
A
A
16
15
12
11
6
10
8
7
5
4
3
20
21
22
23
24
25
26
27
1
2
14
9
17
18
19
BL 15
BL 0
BL 48.5
NOTE
TRIM DOOR AS REQUIRED TO
OBTAIN 0.12 CLEARANCE
DOOR
COAMING (REF)
0.12 ± 0.03 (TYP)
SECT A-A
SEE NOTE
B114-234-345L
54439

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 22)

CARGO LOADING RAMP ASSEMBLY

INDEX NO.	NOMENCLATURE	BUTT LINE	WATERLINE	STATION	SHEET REF.
1	FORMER	48.50 RH TO 48.50 LH	RAMP 1.50	FUSELAGE 488.33	10 AND 11
2	FORMER	48.50 RH TO 48.50 LH	RAMP 9.50	RAMP 10.077	10 AND 11
3	BEAM	20.0 TO 44.0 RH AND LH	RAMP 9.50	RAMP 23.846	15 AND 16
4	FORMER	44.0 TO 48.5 RH AND LH	RAMP 3.50	RAMP 26.30	10 AND 11
5	FORMER	48.50 TO 66.0 RH AND LH	RAMP 4.75	RAMP 37.526	10 AND 11
6	BEAM	20.0 TO 44.0 RH AND LH	RAMP 9.5	RAMP 52.926	15 AND 16
7	FORMER	48.5 TO 64.0 RH AND LH	RAMP 5.25	RAMP 53.04	12, 13, AND 14
8	FORMER	48.5 TO 61.75 RH AND LH	RAMP 6.50	RAMP 60.63	12, 13, AND 14
9	GATE	44.0 RH TO 44.0 LH	RAMP 0.25	RAMP 68.246	19 AND 20
10	FORMER	59.23 RH TO 59.23 LH	RAMP 9.50	RAMP 68.246	12, 13, AND 14
11	FORMER	53.5 RH TO 53.5 LH	RAMP 9.50	RAMP 83.60	12, 13, AND 14
12	FORMER	50.25 RH TO 50.25 LH	RAMP 10.50	RAMP 98.955	12, 13, AND 14
13	CARGO DOOR	--	--	--	3
14	AUXILIARY RAMP	--	--	RAMP 98.955	
15	BEAM	15.00 LH	RAMP 10.40	RAMP 83.60 TO 98.955	17 AND 18
16	BEAM	0.00	RAMP 10.40	RAMP 83.60 TO 98.955	17 AND 18
17	BEAM	15.00 RH	RAMP 10.40	RAMP 83.60 TO 98.955	17 AND 18
18	SKIN	--	--	--	6 AND 7
19	FLOORING	--	--	--	6 AND 21
20	BEAM	48.50 RH AND LH	RAMP 0.50	RAMP 0.00 TO 98.955	15 AND 16
21	BEAM	44.00 RH AND LH	RAMP 10.50	RAMP 0.00 TO 98.955	17 AND 18
22	BEAM	36.20 RH AND LH	RAMP 1.75	RAMP 0.75 TO 10.00	15 AND 16
23	BEAM	28.60 RH AND LH	RAMP 1.75	RAMP 0.75 TO 10.00	15 AND 16
24	BEAM	20.00 RH AND LH	RAMP 10.50	RAMP 0.00 TO 98.955	17 AND 18
25	BEAM	14.892 RH AND LH	RAMP 1.75	RAMP 0.75 TO 10.00	15 AND 16
26	BEAM	10.642 RH AND LH	RAMP 1.75	RAMP 0.75 TO 10.00	15 AND 16
27	BEAM	3.50 RH AND LH	RAMP 1.75	RAMP 0.75 TO 10.00	15 AND 16

NOTE

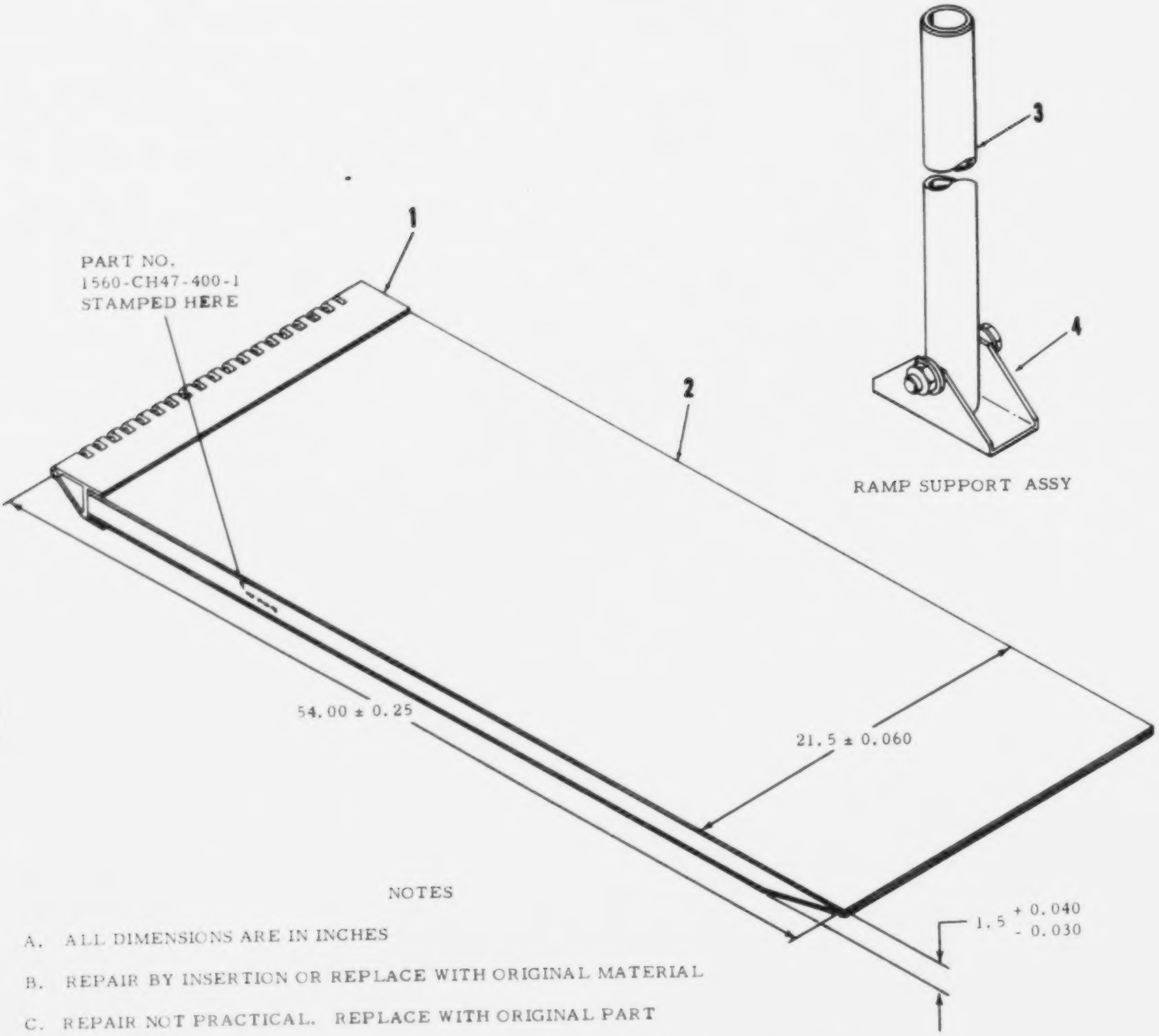
ALL DIMENSIONS ARE IN INCHES

42x30

B114-235-345V

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 22)

AUXILIARY CARGO LOADING RAMP 1560-CH47-400 SERIES (TYPICAL)


1
PART NO.
1560-CH47-400-1
STAMPED HERE
2
3
4
RAMP SUPPORT ASSY
54.00 ± 0.25
21.5 ± 0.060
1.5 + 0.040 - 0.030

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPAIR BY INSERTION OR REPLACE WITH ORIGINAL MATERIAL

C. REPAIR NOT PRACTICAL. REPLACE WITH ORIGINAL PART

D. FABRICATE REPLACEMENT. REFER TO PARA 2-655 OR REPLACE WITH NEW ORIGINAL PART

E. REPAIR NOT PRACTICAL. FABRICATE NEW PART OR REPLACE WITH NEW ORIGINAL MATERIAL

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	HINGE ASSY	DOW 10566 6061-T6	NOTE B.	--
2	STRUCTURAL MEMBER	DOW XM18 6061-T6	NOTE C.	--
3	SUPPORT	1.25 O. D. 0.083 THK WALL 6061-T6	NOTE D.	2-17
4	FOOT	0.125 5052-H34	NOTE E.	--

42 x 53

B114-602-345V

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 22)

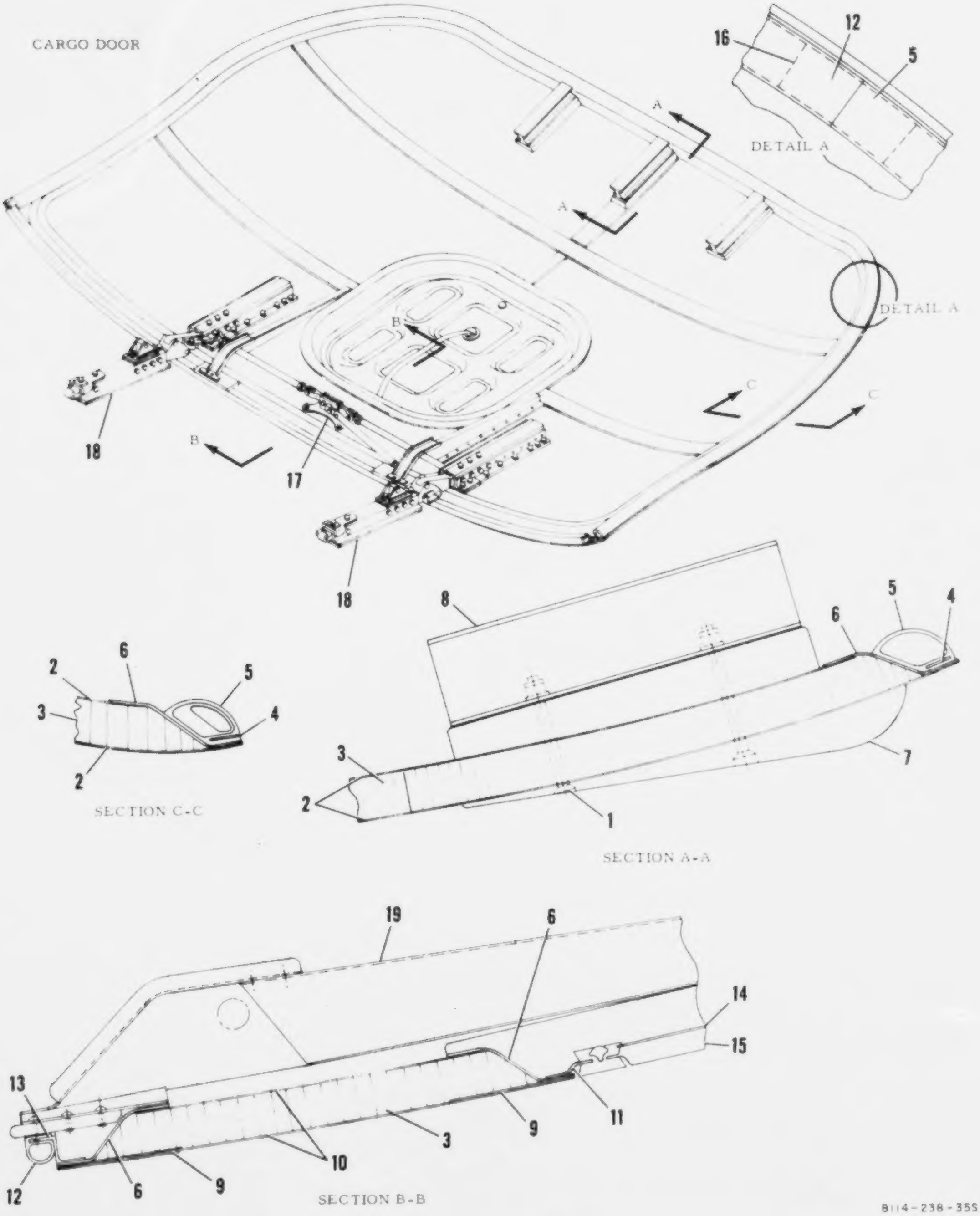

CARGO DOOR
16
12
5
DETAIL A
A
A
DETAIL A
B
C
C
18
B
17
18
8
5
4
6
2
6
5
3
4
2
SECTION C-C
3
2
7
1
SECTION A-A
19
6
14
15
13
11
9
3
10
12
6
9
SECTION B-B
B114-238-355

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 4 of 22)

CARGO DOOR

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CORE	0.968 2.3-1/4-10N-3003	NOTES B. AND C.	--
2	SKIN	0.020 2024-T4 CLAD	NOTE B.	--
3	CORE	0.968 6.0-1/4-30N-3003	NOTE B.	--
4	SEAL STRIP	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD	2-7
5	SEAL	BAC1530-43 SILICONE RUBBER	NOTE D.	--
6	EDGE MEMBER	SCOTCH PLY	NOTE B.	--
7	PAD ASSEMBLY	--	NOTE E.	--
8	SPACER	VS90585 6061-T6	NOTE F.	--
9	DOUBLER	0.012 7075-T6 CLAD	NOTE B.	--
10	SKIN	0.016 7075-T6 CLAD	NOTE B.	--
11	COAMING	0.040 2024-T4 CLAD	0.050 2024-T4 CLAD	--
12	SEAL	SILICONE RUBBER NO. 7030	NOTE D.	--
13	FORMER	AND10139-0505 7075-T6	0.071 4130	--
14	FRAME, PANEL	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
15	PANEL	0.020 6061-T6 BARE	0.025 6061-T6 CLAD	--
16	SEAL SPLICE	SILICONE RUBBER	NOTE G.	--
17	EMERGENCY RELEASE	--	NOTE E.	--
18	SUPPORT ASSEMBLY	--	NOTE E.	--
19	ZEE	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. COMPONENT OF A BONDED ASSEMBLY, REPAIR USING SAME TYPE MATERIAL AS ORIGINAL. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2

C. USED IN PAD ASSEMBLY AREA ONLY

D. SEALS (5 AND 12) ARE HOLLOW, EXTRUDED RUBBER PARTS AND MAY BE REPAIRED BY SPLICING WITH SPONGE RUBBER, AND/OR REPLACING DAMAGED SECTIONS. THE SEAL(5) MAY ALSO BE REPAIRED USING A PIECE OF THE VS80549 SEAL SPLICE MATERIAL. WHEN SEALS ARE EXTENSIVELY DAMAGED REPLACE THE ENTIRE SEAL.

E. REPLACE WITH NEW PART SAME AS ORIGINAL.

F. REPLACE WITH ORIGINAL MATERIAL.

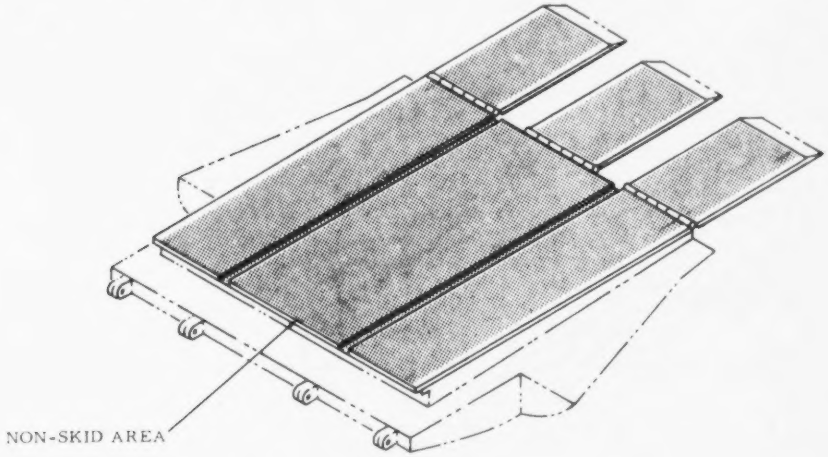
G. REPLACE WITH NEW SEAL SPLICE VS80549

42x36

B114 239 345V

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 5 of 22)

CARGO LOADING RAMP--APPLICATION OF NON-SKID PAINT



NOTES

A. APPLY NON-SKID PAINT (C230) IF REPAIRS ARE MADE TO WALKWAY AREA OR IF EXISTING COATING IS WORN

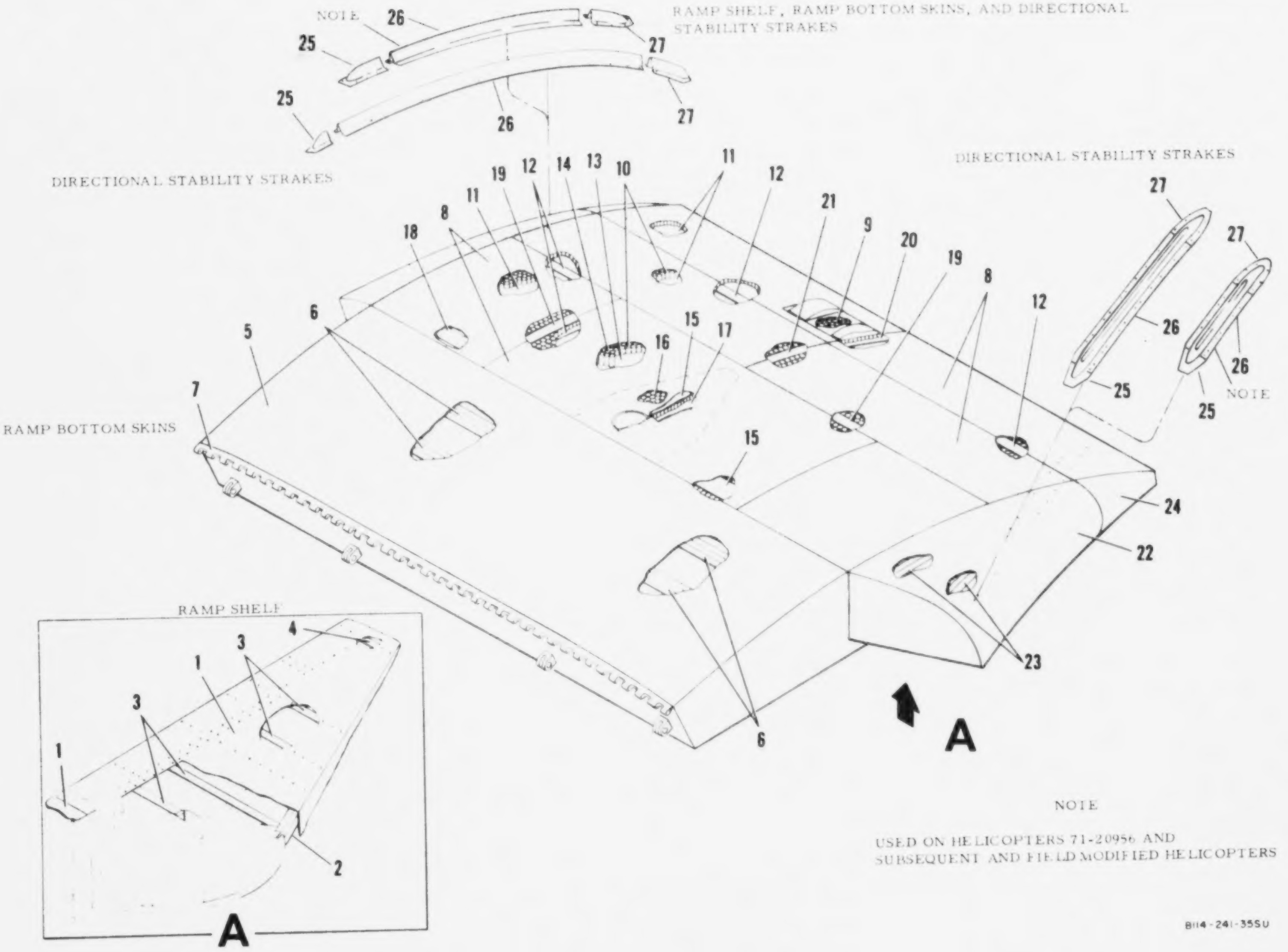
B. DO NOT APPLY NON-SKID PAINT TO CARGO TIE-DOWN RETAINERS

C. SEE FIG. 2-129 FOR INFORMATION ON REPLACEMENT OF MARKINGS

42x33

B114 5 34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 6 of 22)


NOTE
26
25
25
26
27
27
RAMP SHELF, RAMP BOTTOM SKINS, AND DIRECTIONAL STABILITY STRAKES
DIRECTIONAL STABILITY STRAKES
DIRECTIONAL STABILITY STRAKES
19
12
14
13
10
11
12
21
9
20
19
8
12
11
8
18
5
6
15
17
16
7
RAMP BOTTOM SKINS
15
27
27
26
26
25
25
NOTE
24
22
23
6
A
RAMP SHELF
4
3
1
3
1
2
A

NOTE

USED ON HELICOPTERS 71-20956 AND SUBSEQUENT AND FIELD MODIFIED HELICOPTERS

B114-241-355U

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 7 of 22)

RAMP SHELF, RAMP BOTTOM SKINS, AND DIRECTIONAL STABILITY STRAKES

RAMP SHELF

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD	2-7
2	CAP	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	--
3	STIFFENER	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	--
4	STIFFENER	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	--

RAMP BOTTOM SKINS--RAMP STATION 0.00 TO 37.526, BUTT LINE 48.50 TO 48.50

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
5	SKIN	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
6	STIFFENER	0.032 2024-T4 CLAD	0.40 2024-T3 CLAD	--
7	HINGE	VS20106-1	NOTE C.	--

RAMP BOTTOM SKINS--RAMP STATION 37.526 TO 98.995, BUTT LINE 48.50 INBOARD

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
8	OUTER SKIN	0.020 7075-T6 CLAD	0.032 7075-T6 CLAD	--
9	CORE	0.97 6.0-1/4-30N-3003	NOTE B.	--
10	CORE	0.97 3.3-1/4-15N-3003	NOTE B.	--
11	INNER SKIN	0.016 7075-T6 CLAD	0.020 7075-T6 CLAD	--
12	SPLICE PLATE	0.016 7075-T6 CLAD	0.020 7075-T6 CLAD	--
13	INNER SKIN	0.012 7075-T6 CLAD	0.016 7975-T6 CLAD	--
14	CORE	0.97 5.1-1/4-25N-3003	NOTE B.	--
15	DOUBLER	0.016 7075-T6 CLAD	0.020 7075-T6 CLAD	--
16	CORE	0.97 6.0-1/4-30N-3003	NOTE B.	--
17	DOUBLER	0.012 7075-T6 CLAD	NOTE B.	--
18	EDGE MEMBER	SCOTCH PLY	NOTE B.	--
19	SPLICE PLATE	0.020 7075-T6 CLAD	NOTE B.	--
20	SPLICE PLATE	0.016 7075-T6 CLAD	NOTE B.	--
21	SPLICE PLATE	0.020 7075-T6 CLAD	NOTE B.	--

RAMP BOTTOM SKINS--RAMP STATION 37.526 TO 98.995, BUTT LINE 48.50 OUTBOARD

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
22	SKIN	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
23	STRINGER	0.032 7076-T6 CLAD	0.040 7076-T6 CLAD	--
24	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7

DIRECTIONAL STABILITY STRAKES

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
25	CENTER STRAKE	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	--
26	NOSE STRAKE	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	--
27	TAIL STRAKE	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

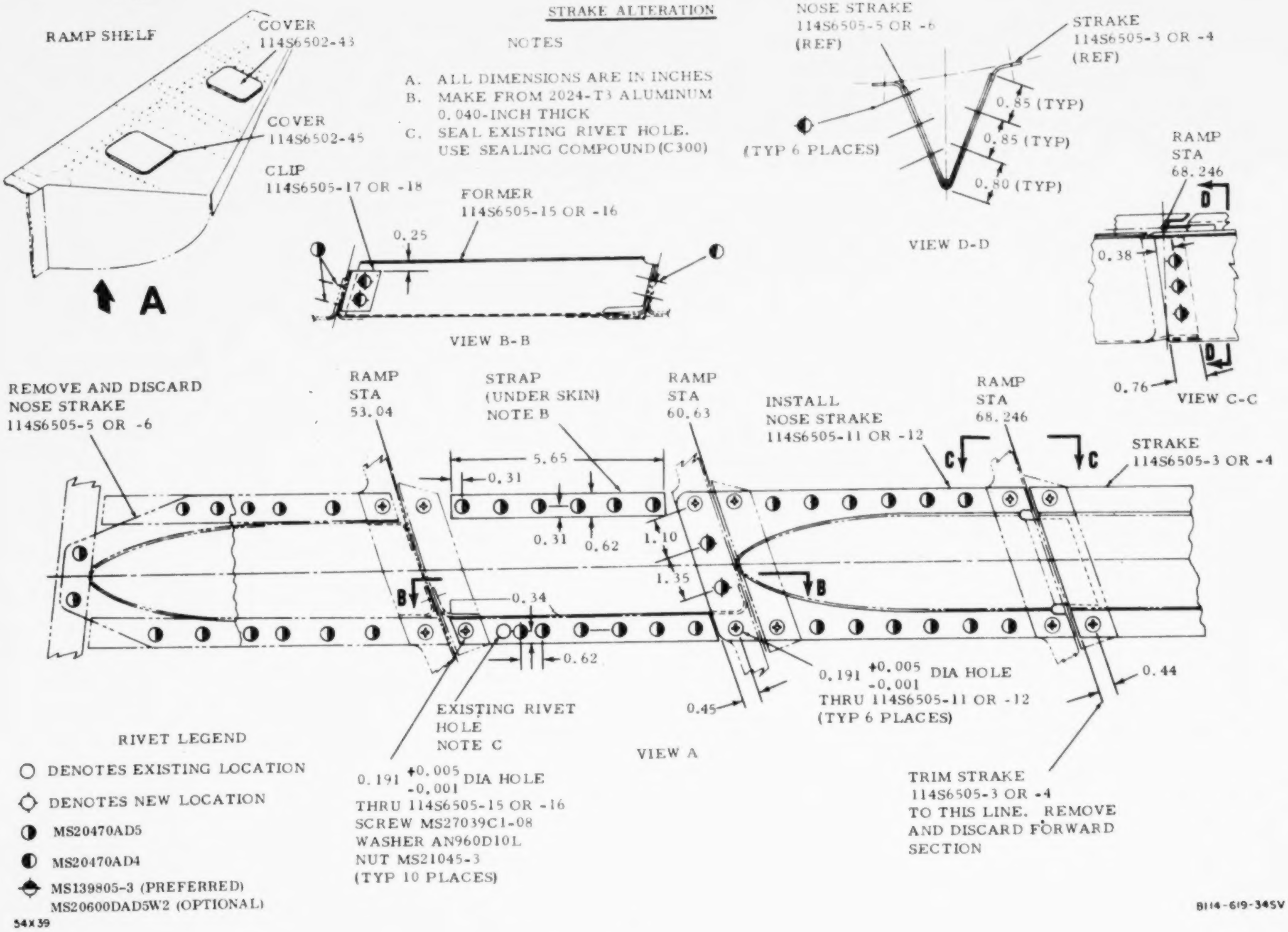
B. COMPONENT PART OF A BONDED ASSEMBLY.
REPAIR USING SAME TYPE MATERIAL AS ORIGINAL.
REFER TO TM 55-1500-204-25/1 AND TB 746-93-2

C. REPLACE WITH SAME MATERIAL AS ORIGINAL

42x54

B114-242-34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 8 of 22)



STRAKE ALTERATION

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. MAKE FROM 2024-T3 ALUMINUM 0.040-INCH THICK
C. SEAL EXISTING RIVET HOLE. USE SEALING COMPOUND (C300)

RIVET LEGEND

○ DENOTES EXISTING LOCATION
◇ DENOTES NEW LOCATION
◑ MS20470AD5
◐ MS20470AD4
◆ MS139805-3 (PREFERRED) MS20600DAD5W2 (OPTIONAL)

RAMP SHELF
COVER 114S6502-43
COVER 114S6502-45
A
CLIP 114S6505-17 OR -18
FORMER 114S6505-15 OR -16
0.25
VIEW B-B
NOSE STRAKE 114S6505-5 OR -6 (REF)
STRAKE 114S6505-3 OR -4 (REF)
(TYP 6 PLACES)
0.85 (TYP)
0.85 (TYP)
0.80 (TYP)
VIEW D-D
RAMP STA 68.246
D
0.38
D
0.76
VIEW C-C
REMOVE AND DISCARD NOSE STRAKE 114S6505-5 OR -6
RAMP STA 53.04
STRAP (UNDER SKIN) NOTE B
5.65
0.31
0.31
0.62
RAMP STA 60.63
1.10
1.35
INSTALL NOSE STRAKE 114S6505-11 OR -12
RAMP STA 68.246
C
C
STRAKE 114S6505-3 OR -4
B
B
0.34
0.62
EXISTING RIVET HOLE NOTE C
0.45
0.191 +0.005 -0.001 DIA HOLE THRU 114S6505-11 OR -12 (TYP 6 PLACES)
0.44
VIEW A
0.191 +0.005 -0.001 DIA HOLE THRU 114S6505-15 OR -16 SCREW MS27039C1-08 WASHER AN960D10L NUT MS21045-3 (TYP 10 PLACES)
TRIM STRAKE 114S6505-3 OR -4 TO THIS LINE. REMOVE AND DISCARD FORWARD SECTION
54X39
B114-619-345V

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 9 of 22)

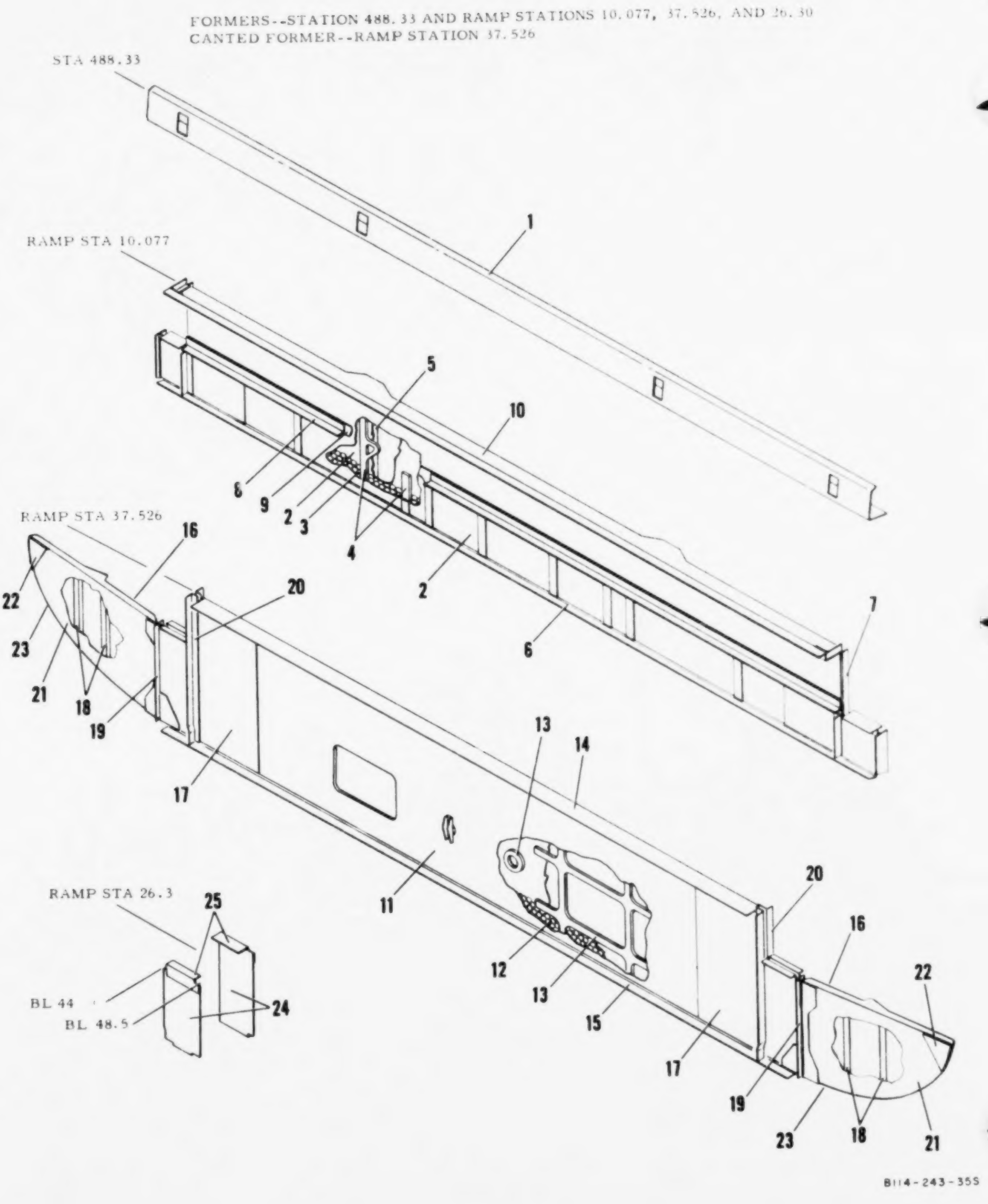

FORMERS--STATION 488.33 AND RAMP STATIONS 10.077, 37.526, AND 26.30
CANTED FORMER--RAMP STATION 37.526
STA 488.33
1
RAMP STA 10.077
5
10
8
9
2
3
4
2
RAMP STA 37.526
16
22
20
23
21
18
19
6
7
17
13
14
11
12
13
15
20
16
22
17
19
23
18
21
RAMP STA 26.3
25
BL 44
BL 48.5
24
B114-243-355

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 10 of 22)

FORMERS--STATION 488.33 AND RAMP STATIONS 10.077, 37.526, AND 26.30
CANTED FORMER--RAMP STATION 37.526

FORMER--STATION 488.33

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FORMER	0.050 7075-T6 CLAD	0.050 7075-T6 CLAD	--

FORMER--RAMP STATION 10.077

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
2	SKIN	0.012 7075-T6 CLAD	NOTE B.	--
3	CORE	0.255 2.30-1/4-10N-3003	NOTE B.	--
4	FILLER	0.250 7075-T6 PLATE	NOTE B.	--
5	STIFFENER	REYNOLDS 5761 7075-T6	0.071 4130	--
6	CAP	VS90542 7075-T6	NOTE B.	--
7	STIFFENER	AND10133-0701 7075-T6	0.071 4130	--
8	STIFFENER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
9	DOUBLER	0.012 7075-T6 CLAD	NOTE B.	--
10	CAP	VS90543 7075-T6	NOTE B.	--

FORMER--RAMP STATION 37.526

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
11	SKIN	0.012 7075-T6 CLAD	NOTE B.	--
12	CORE	0.255 2.3-1/4-10N-3003	NOTE B.	--
13	FILLER	0.250 7075-T6 BARE	NOTE B.	--
14	CAP	VS90303 7075-T6	NOTE B.	--
15	CAP	VS90317 7075-T6	NOTE B.	--
16	CAP	BAC1503-100037 7075-T6	0.063 4130	--
17	DOUBLER	0.016 7075-T6 BARE	NOTE B.	--
18	STIFFENER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
19	ATTACHMENT	BAC1505-100515 7075-T6	NOTE B.	--
20	STIFFENER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
21	WEB	0.020 7075-T6 CLAD	0.025 7075-T6 CLAD	2-7
22	GUSSET	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD	2-7
23	CAP	0.063 7075-T6 CLAD	0.063 7075-T6 CLAD	--

FORMER--RAMP ACTUATOR SUPPORT, RAMP STATION 26.30

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
24	FORMER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
25	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. COMPONENT OF SANDWICH HONEYCOMB STRUCTURE. REPAIR USING SAME TYPE MATERIAL AS ORIGINAL. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2

42x42

B114-244-34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 11 of 22)

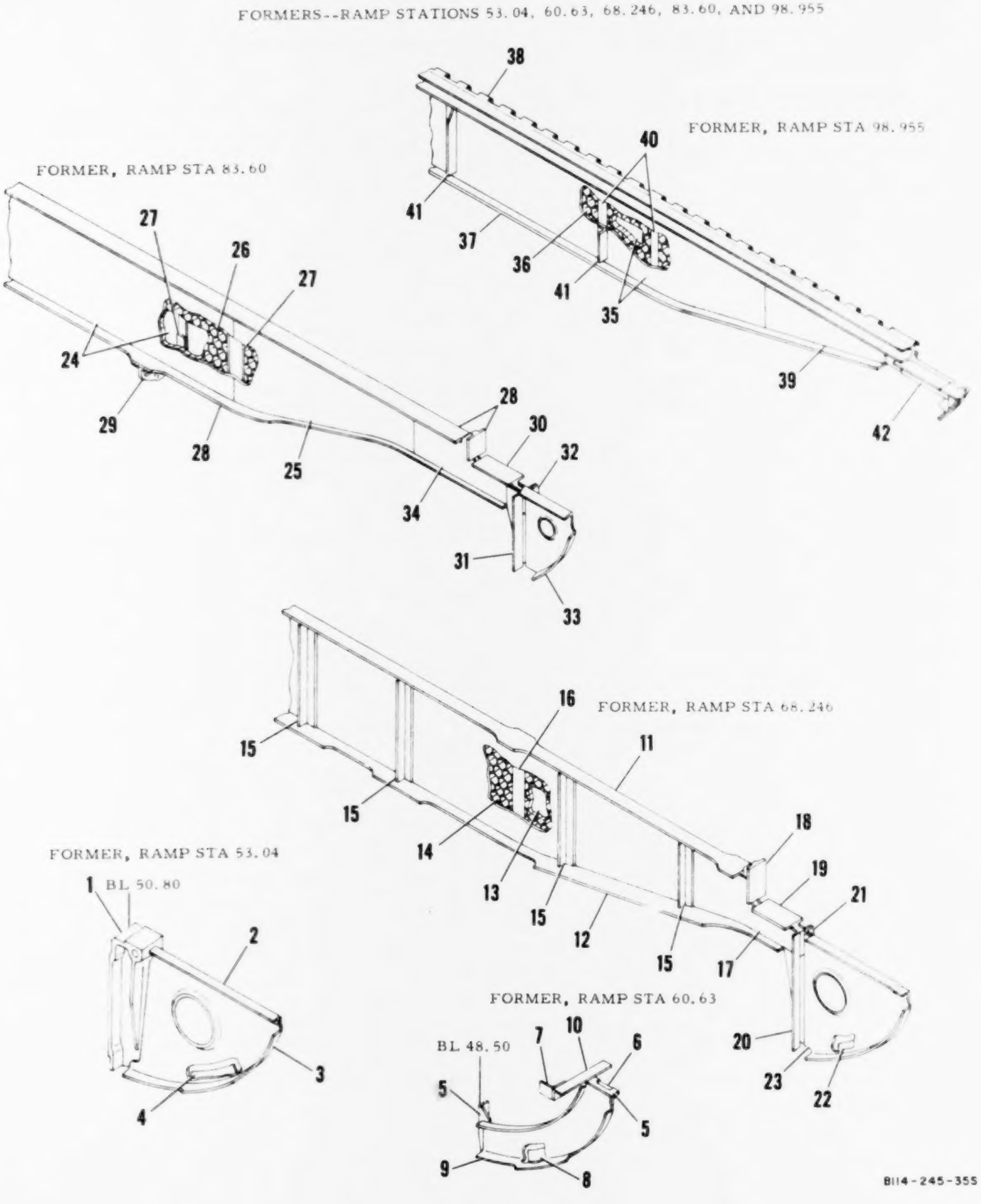

FORMERS--RAMP STATIONS 53.04, 60.63, 68.246, 83.60, AND 98.955
FORMER, RAMP STA 98.955
38
40
41
37
36
41
35
39
42
FORMER, RAMP STA 83.60
27
26
27
24
29
28
25
28
30
32
34
31
33
FORMER, RAMP STA 68.246
16
15
15
11
14
13
15
12
15
17
18
19
21
20
23
22
FORMER, RAMP STA 53.04
1
BL 50.80
2
3
4
FORMER, RAMP STA 60.63
BL 48.50
7
10
6
5
5
9
8
B114-245-355

Figure 2-12. Cargo Loading Ramp Assembly Repairs—
Aft Fuselage Structure Assembly (Sheet 12 of 22)

FORMERS--RAMP STATIONS 53.04, 60.63, 68.246, 83.60 AND 98.955

FORMER--RAMP STATION 53.04

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	SUPPORT	2014-T6	NOTE B.	--
2	ANGLE	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	--
3	WEB	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
4	ANGLE	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	--

FORMER--RAMP STATION 60.63

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
5	CLIP	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	--
6	FILLER	0.040 2024-T3 CLAD	NOTE C.	--
7	CLIP	0.040 2024-T3 CLAD	0.050 7075-T6 CLAD	--
8	ANGLE	0.050 2024-0 T42	0.050 2024-T3 CLAD	--
9	FORMER	0.040 2024-0 T42	0.050 2024-T3 CLAD	--
10	ANGLE	ALCOA 28546 7075-T6	0.050 4130	--

FORMER--RAMP STATION 68.246

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
11	CAP	VS90302 7075-T6	NOTE D.	--
12	CAP	BAC1505-100511 7075-T6	NOTE D.	--
13	WEB	0.012 7075-T6 CLAD	NOTE D.	--
14	CORE	0.255 2.3-1/4-10N-3003	NOTE D.	--
15	STIFFENER	BAC1503-1402 7075-T6	NOTE D.	--
16	FILLER	0.250 7075-T6 BARE	NOTE D.	--
17	DOUBLER	0.032 7075-T6 BARE	NOTE D.	--
18	CAP	VS90302 7075-T6	NOTE D.	--
19	CAP	VS90317 7075-T6	NOTE D.	--
20	CLIP	ALCOA 61971 7075-T6	0.063 4130	--
21	CAP	ALCOA 22477 7075-T6	0.050 4130	--
22	ANGLE	0.050 2024-T4 CLAD	0.050 2024-T3 CLAD	--
23	WEB	0.020 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7

FORMER--RAMP STATION 83.60

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
24	WEB	0.012 7075-T6 CLAD	NOTE D.	--
25	WEB	0.016 7075-T6 CLAD	NOTE D.	--
26	CORE	0.255 3.0-3/8-20N-3003	NOTE D.	--
27	FILLER	0.250 2024-T4	NOTE D.	--
28	CAP	VS90302 7075-T6	NOTE D.	--
29	SUPPORT		NOTE E.	--
30	CAP	VS90317 7075-T6	NOTE D.	--
31	CLIP	ALCOA 61971 7075-T6	0.063 4130	--
32	CAP	ALCOA 22509 7075-T6	0.050 4130	--
33	WEB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
34	DOUBLER	0.032 7075-T6 CLAD	NOTE D.	--

42 x 46

B114-246-34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 13 of 22)

FORMERS--RAMP STATIONS 53.04, 60.63, 68.246, 83.60, AND 98.955

FORMER--RAMP STATION 98.955

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
35	WEB	0.012 7075-T6 CLAD	NOTE D.	--
36	CORE	0.255 3.0-3/8-20N-3003	NOTE D.	--
37	CAP	VS90302 7075-T6	NOTE D.	--
38	HINGE	VS90560 7075-T6	NOTE D.	2-68
39	DOUBLER	0.016 7075-T6 CLAD	NOTE D.	--
40	FILLER	0.250 2024-T4 BARE	NOTE D.	--
41	CLIP	HARVEY 15078 7075-T6	0.063 4130	--
42	CLIP	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	--

NOTES

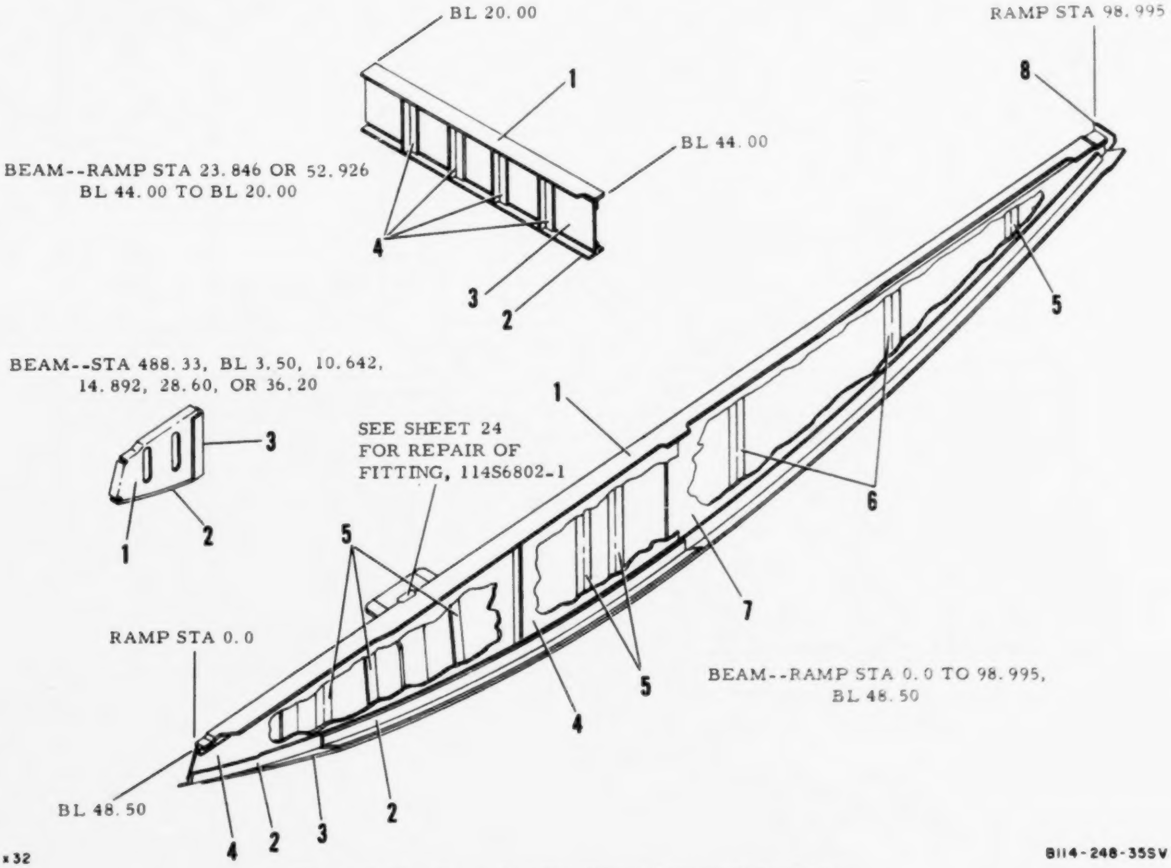
A. ALL DIMENSIONS ARE IN INCHES
B. DAMAGE FOR OTHER THAN NEGLIGIBLE, REPLACE WITH NEW SUPPORT 114S6804-1 LH OR -2 RH
C. REPLACE WITH MATERIAL SAME AS ORIGINAL
D. COMPONENT PART OF A BONDED ASSEMBLY. REPAIR USING SAME TYPE MATERIAL AS ORIGINAL. REFER TO PARA TM 55-1500-204-25/1 AND TB 746-93-2
E. DAMAGE FOR OTHER THAN NEGLIGIBLE, REPLACE WITH NEW SUPPORT 114S6821-1

42x23

B114 247 34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 14 of 22)

BEAMS--BUTT LINES 3.50, 10.642, 14.892, 20.00, 28.60, 36.20, 44.00, AND 48.50


BL 20.00
RAMP STA 98.995
1
8
BL 44.00
BEAM--RAMP STA 23.846 OR 52.926
BL 44.00 TO BL 20.00
4
3
2
5
BEAM--STA 488.33, BL 3.50, 10.642,
14.892, 28.60, OR 36.20
3
1
2
1
SEE SHEET 24
FOR REPAIR OF
FITTING, 114S6802-1
6
5
7
RAMP STA 0.0
5
4
BEAM--RAMP STA 0.0 TO 98.995,
BL 48.50
BL 48.50
4
2
3
2

42 x 32

B114-248-35SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 15 of 22)

BEAMS--BUTT LINES 3.50, 10.642, 14.892, 20.00,
28.60, 36.20, 44.00, AND 48.50

BEAMS--RAMP STATION 23.846 OR 52.926, BUTT LINE 44.00 TO 20.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STIFFENER	ALCOA 22008 7075-T6	0.040 4130	--
2	ANGLE	ALCOA 12883 7075-T6	0.063 4130	--
3	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
4	STIFFENER	ALCOA 12883 7075-T6	0.063 4130	--

BEAMS--STATION 488.33, BUTT LINES 3.50, 10.642, 14.892, 28.60, AND 36.20

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	2-7
2	CAP	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	--
3	CLIP	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--

BEAM--RAMP STATION 0.0 TO 98.995, BUTT LINE 48.50

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 55794 7075-T6	0.100 4130	--
2	ANGLE	0.070 7075-T6 CLAD	0.080 7075-T6 CLAD	--
3	CAP	0.063 7075-T6 CLAD	0.071 7075-T6 CLAD	--
4	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
5	STIFFENER	ALCOA 67580 7075-T6	0.063 4130	--
6	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
7	WEB	0.025 7075-T6 BARE	0.030 7075-T6 CLAD	2-7
8	CAP	ALCOA 55794 7075-T6	0.100 4130	--

NOTE

ALL DIMENSIONS ARE IN INCHES

42x36

B114-249-34SV

***Figure 2-12. Cargo Loading Ramp Assembly Repairs—
Aft Fuselage Structure Assembly (Sheet 16 of 22)***

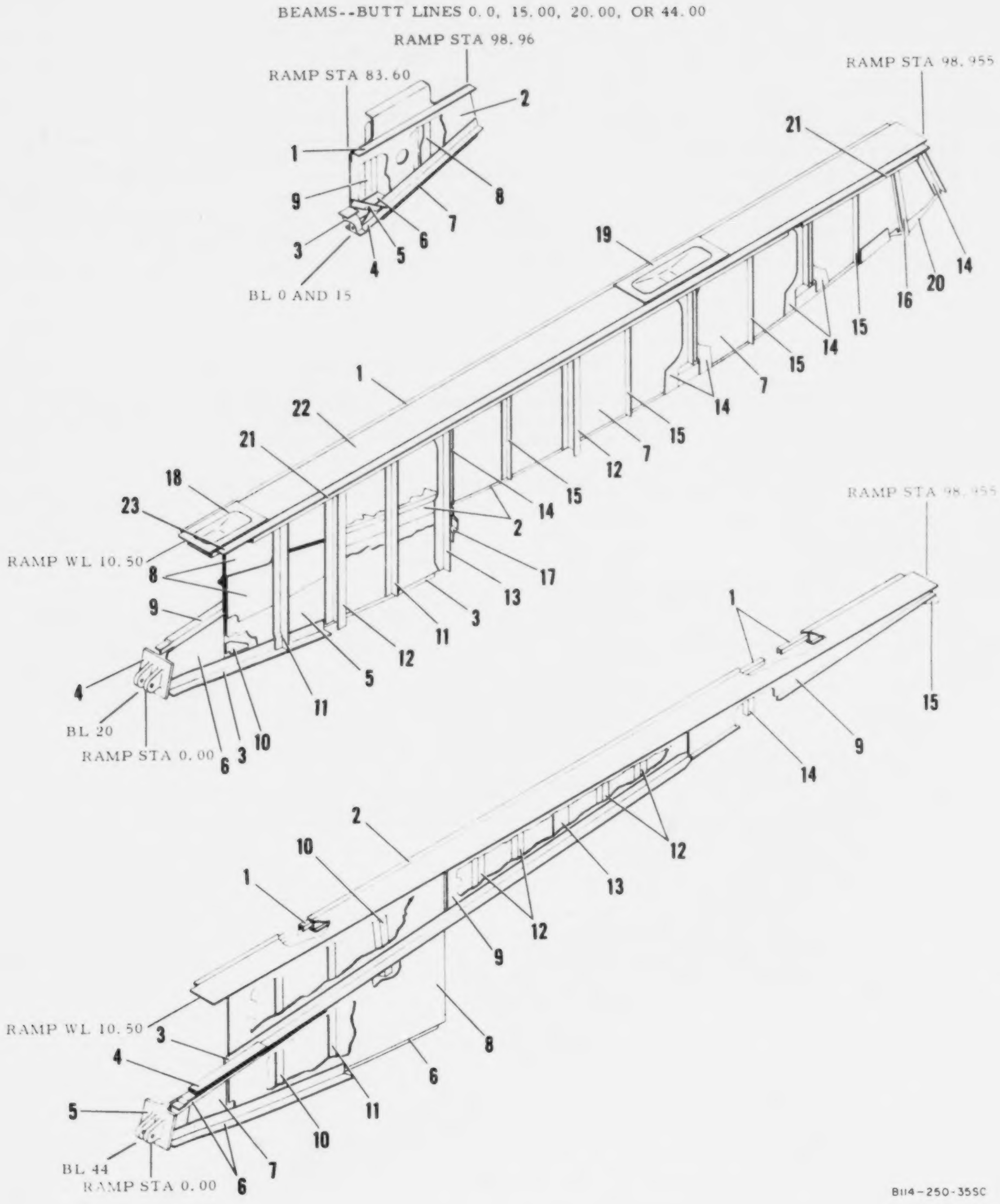

BEAMS--BUTT LINES 0.0, 15.00, 20.00, OR 44.00
RAMP STA 98.96
RAMP STA 83.60
2
1
9
8
7
3
6
5
4
BL 0 AND 15
RAMP STA 98.955
21
19
14
20
16
15
14
15
7
14
1
15
22
7
12
21
15
18
14
2
23
17
RAMP WL 10.50
8
9
13
3
11
12
4
5
11
BL 20
10
RAMP STA 0.00
6
3
RAMP STA 98.955
1
15
9
14
2
12
10
13
1
12
9
8
RAMP WL 10.50
3
4
6
11
5
10
7
BL 44
RAMP STA 0.00
6
B114-250-35SC

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 17 of 22)

BEAMS--BUTT LINES 0.00, 15.00, 20.00, AND 44.00

BEAMS--BUTT LINES 0.00 AND 15.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CAP	ALCOA 12883 7075-T6	0.063 4130
2	WEB	0.050 7075-T6	0.063 7075-T6 CLAD
3	SUPPORT	VS90328 7075-T6	NOTE B.
4	CAP	REYNOLDS 8665 7075-T6	0.090 4130
5	CAP	0.063 7075-T6 CLAD	0.071 7075-T6 CLAD
6	PAD	0.188 NYLON SHEET	NOTE B.
7	DOUBLER	0.040 7075-T6	0.050 7075-T6 CLAD
8	STIFFENER	AND10136-1401 7075-T6	0.071 4130
9	STIFFENER	ALCOA 12883 7075-T6	0.071 4130

BEAMS--BUTT LINES 20.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
△ 1	CAP	VS90544 MAGZK60A-T5	NOTE B.
□	CAP		NOTE F.
2	CAP	VS90413 7075-T6	NOTE B.
3	CAP	AND10134-1202 7075-T6	0.100 4130
4	HINGE	114S6806-1 AND-2	NOTE B.
5	WEB	0.032 7075-T6	0.040 7075-T6 CLAD
6	WEB	0.063 7075-T6	0.071 7075-T6 CLAD
7	WEB	0.020 7075-T6	0.025 7075-T6 CLAD
8	DOUBLE	0.020 7075-T6	0.025 7075-T6 CLAD
9	CAP	AND10133-1203 7075-T6	0.125 4130
10	GUSSET	0.032 7075-T6	0.040 4130
11	STIFFENER	ALCOA 15820 7075-T6	0.080 4130
12	STIFFENER	ALCOA 59256 7075-T6	0.063 4130
13	STIFFENER	ALCOA 30934 7075-T6	0.071 4130
14	STIFFENER	0.032 7075-T6	0.036 7075-T6 CLAD
15	STIFFENER	ALCOA 28546 7075-T6	0.050 4130
16	STIFFENER	AND10138-1004 7075-T6	0.071 4130
17	BUMPER	--	NOTE C.
△ 18	RECEPTACLE	--	NOTE D.
△ 19	RECEPTACLE	--	NOTE D.
20	TRACK	--	NOTE E.
△ 21	GANG CHANNEL	RM52LHTG51-02-J32	NOTE B.
△ 22	COVER PLATE	0.040 MAG AZ31B-H24	NOTE B.
□ 23	ANGLE	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD

BEAMS--BUTT LINES 44.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	GANG CHANNEL	RM52LHTG51-02-J32	NOTE B.
2	CAP	VS90531 MAG ZK60-AT5	NOTE B.
3	CAP	ALCOA 59409 7075-T6	0.063 4130
4	STRAP	0.063 7075-T6 CLAD	0.071 7075-T6 CLAD
5	HINGE	6806-1-2	NOTE B.
6	CAP	HARVEY 16119 7075-T6	0.150 4130
7	WEB	0.063 7075-T6 BARE	0.071 7075-T6 CLAD
8	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
9	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD
10	STIFFENER	ALCOA 67580 7075-T6	0.063 4130
11	STIFFENER	ALCOA 51406 7075-T6	0.100 4130
12	STIFFENER	VS70504-4 7075-T6	0.040 4130
13	STIFFENER	AND10136-1501 7075-T6	0.071 4130
14	STIFFENER	ALCOA 22477 7075-T6	0.050 4130
15	BRACKET	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD

△ USED ON HELICOPTERS, SERIAL NO. 66-19098 THRU 68-16022

□ USED ON HELICOPTERS, SERIAL NO. 69-17100 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE DAMAGED SECTION WITH MATERIAL SAME AS ORIGINAL

C. REPLACE WITH NEW BUMPER 114SS661-1

D. REPLACE WITH NEW RECEPTACLE 114S2701-3 AFT OR 114S2711-3 FORWARD

E. REPLACE WITH NEW TRACK 114S6811-3 LH OR 114S6811-1 RH

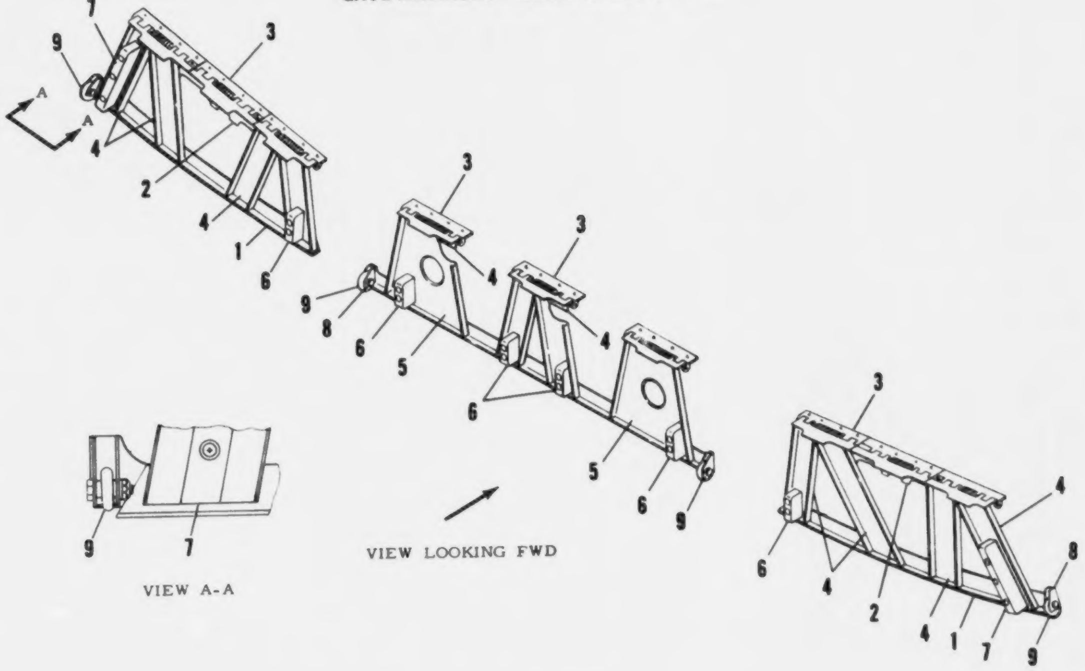
F. REPLACE WITH NEW CAP 114S6151-113LH OR -114RH

42 X 54

B114-251-34SV

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 18 of 22)

GATE ASSEMBLY--CARGO LOADING RAMP


7
9
3
A
A
4
2
4
1
6
3
4
3
9
8
4
6
5
6
5
6
9
3
4
8
6
4
2
4
1
7
9
9
7
VIEW A-A
VIEW LOOKING FWD

B114-252-355A

Figure 2-12. Cargo Loading Ramp Assembly Repairs—
Aft Fuselage Structure Assembly (Sheet 19 of 22)

GATE ASSEMBLY--CARGO LOADING RAMP

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CAP	BAC1514-1644 7075-T6	NOTE B.
2	HINGE	BAC1514-1643 7075-T6	NOTE B.
3	HINGE	BAC1513-367 7075-T6	NOTE B.
4	CHANNEL	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD
5	CHANNEL	0.063 7075-T6 CLAD	0.071 7075-T6 CLAD
6	BUMPER	SILICONE RUBBER LAMINAR	NOTE C.
7	BUMPER	SILICONE RUBBER LAMINAR	NOTE D.
8	BRACKET	ALCOA 56914 7075-T6	0.063 4130
9	ROLLER	NYLON, 1.0-INCH DIA	NOTE E.

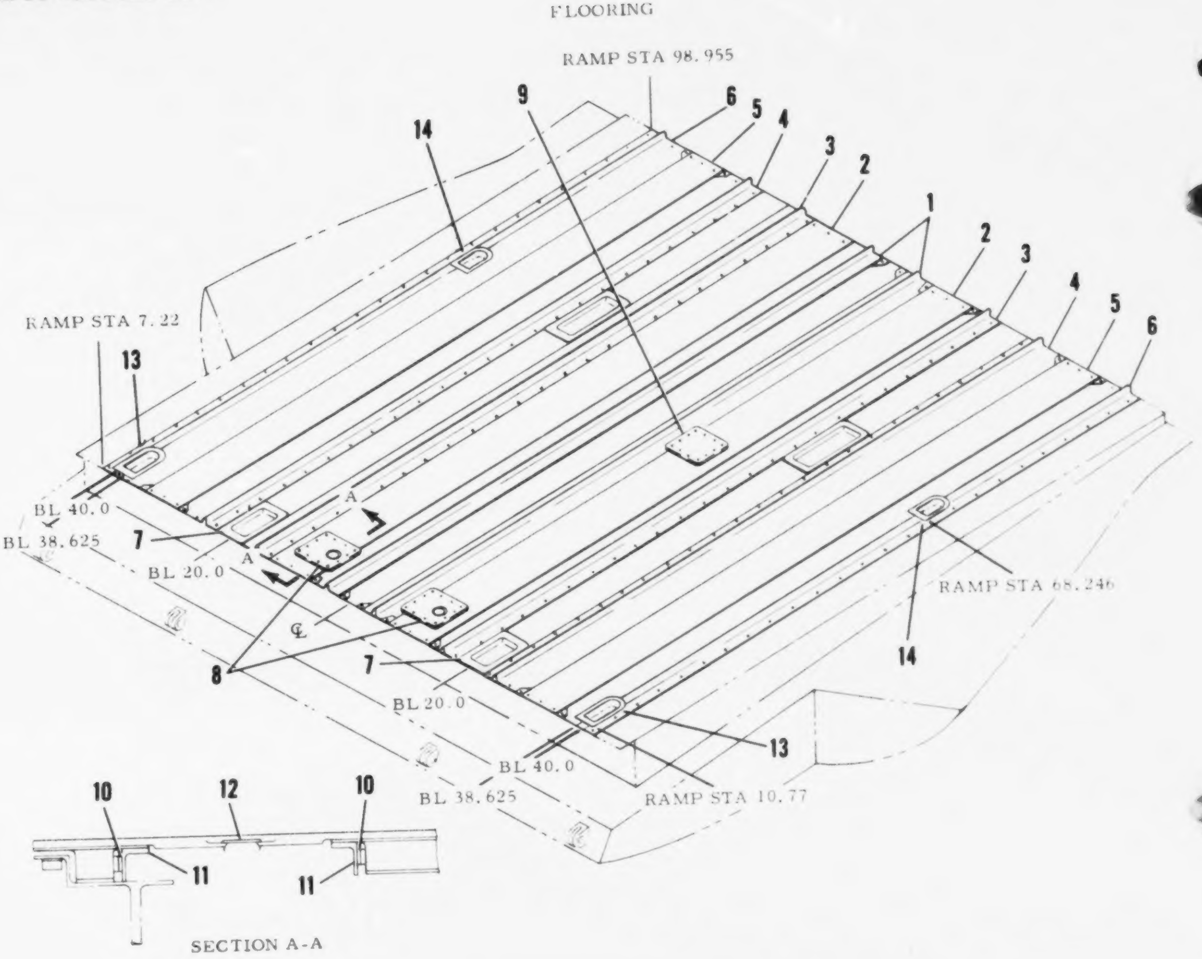
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPAIR IMPRACTICAL. REPLACE PART WITH MATERIAL SAME AS ORIGINAL
C. REPLACE WITH NEW BUMPER 114S6709-1
D. REPLACE WITH NEW BUMPER 114S6709-2
E. REPLACE WITH NEW ROLLER 114S6706-1

42x20

B114-253-345V

Figure 2-12. Cargo Loading Ramp Assembly Repairs—Aft Fuselage Structure Assembly (Sheet 20 of 22)


FLOORING
RAMP STA 98.955
9
14
6
5
4
3
2
1
2
3
4
5
6
RAMP STA 7.22
13
A
BL 40.0
BL 38.625
7
A
BL 20.0
℄
8
7
RAMP STA 68.246
14
BL 20.0
13
BL 40.0
BL 38.625
RAMP STA 10.77
10
12
10
11
11
SECTION A-A

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	PANEL	VS90578 MAG ZK 60A-T5	NOTE B.	2-88
2	PANEL	VS90579 MAG ZK 60A-T5	NOTE B.	2-88
3	PANEL	VS90578 MAG ZK 60A-T5	NOTE B.	2-88
4	PANEL	VS90558 MAG ZK 60A-T5	NOTE B.	2-88
5	PANEL	VS90557 MAG ZK 60A-T5	NOTE B.	2-88
6	PANEL	VS90558 MAG ZK 60A-T5	NOTE B.	2-88
7	BEAM	REFERENCE ONLY	SEE SHEET 17	--
8	PANEL	0.160 7075-T6	NOTE B.	--
9	PANEL	0.160 7075-T6	NOTE B.	--
10	ANGLE	ALCOA 14202 7075-T6	--	--
11	ANGLE	ALCOA 14202 7075-T6	--	--
12	PLUG	SS-48166RK2215	NOTE C.	--
13 △	RECEPTACLE	7075-T6 BARE	NOTE D.	--
14 △	RECEPTACLE	7075-T6 BARE	NOTE E.	--

△ USED ON HELICOPTERS SERIAL NO. 69-17100 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

B. REPAIR MATERIAL SAME AS ORIGINAL

C. REPLACE WITH NEW PLUG, PART NO. SS-48166RK2215

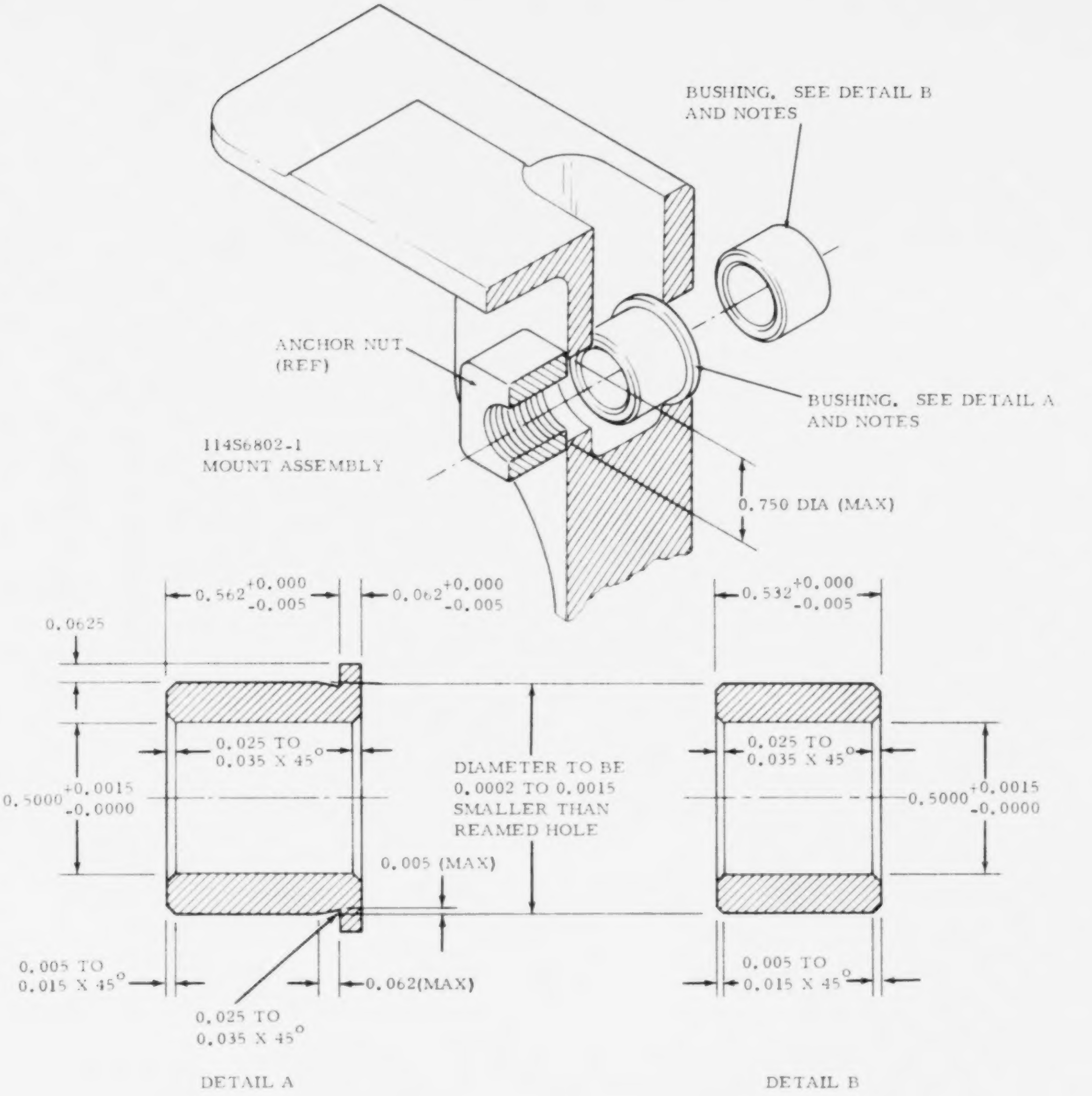
D. REPLACE WITH NEW RECEPTACLE, PART NO. 114S2893-6

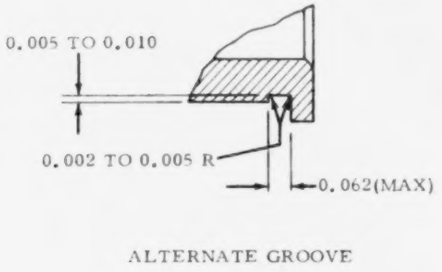
E. REPLACE WITH NEW RECEPTACLE, PART NO. 114S2893-13

B114-254-345V

42x54

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 21 of 22)


BUSHING, SEE DETAIL B AND NOTES
ANCHOR NUT (REF)
BUSHING, SEE DETAIL A AND NOTES
114S6802-1 MOUNT ASSEMBLY
0.750 DIA (MAX)
0.562 +0.000 -0.005
0.062 +0.000 -0.005
0.532 +0.000 -0.005
0.0625
0.025 TO 0.035 X 45°
0.5000 +0.0015 -0.0000
DIAMETER TO BE 0.0002 TO 0.0015 SMALLER THAN REAMED HOLE
0.005 (MAX)
0.005 TO 0.015 X 45°
0.062(MAX)
0.025 TO 0.035 X 45°
DETAIL A
0.025 TO 0.035 X 45°
0.5000 +0.0015 -0.0000
0.005 TO 0.015 X 45°
DETAIL B


0.005 TO 0.010
0.002 TO 0.005 R
0.062(MAX)
ALTERNATE GROOVE

NOTES

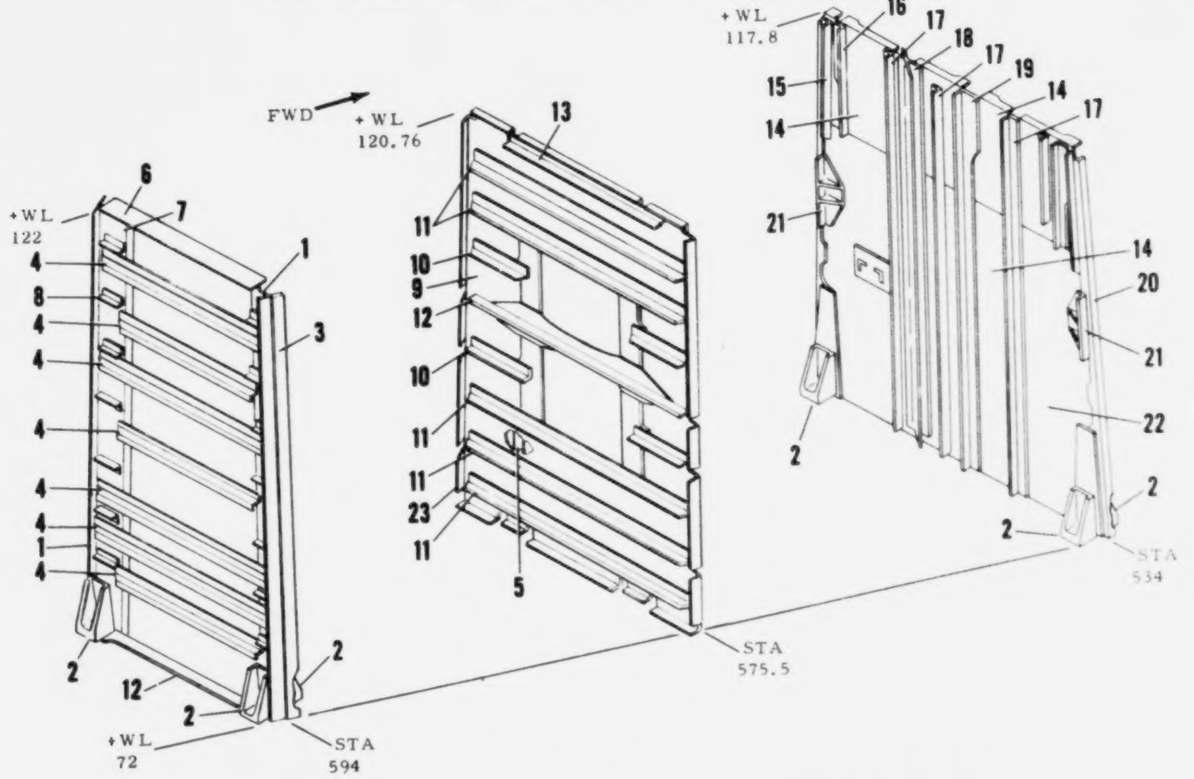
A. ALL DIMENSIONS ARE IN INCHES
B. ID AND OD OF BUSHINGS TO BE CONCENTRIC WITHIN 0.003 TIR
C. HEAT TREAT BUSHINGS TO 125,000 TO 145,000 PSI
D. 125 RHR MAXIMUM MACHINE SURFACE FINISH
E. CADMIUM PLATE IN ACCORDANCE WITH QQ-P-416, TYPE II, CLASS 3
F. ALL DIMENSIONS TO BE MET AFTER PLATING

42x51

B114 457 34S

Figure 2-12. Cargo Loading Ramp Assembly Repairs— Aft Fuselage Structure Assembly (Sheet 22 of 22)

FULL FORMERS -- STATIONS 534.0, 575.50, AND 594.0


+WL
117.8
16
17
18
17
19
14
17
15
14
21
14
20
21
22
2
2
2
STA
534
FWD
+WL
120.76
13
11
10
9
12
10
11
11
23
11
5
STA
575.5
6
+WL
122
7
4
1
8
4
3
4
4
4
4
1
4
2
12
2
2
+WL
72
STA
594

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B114-256-345V (1)

42x34

Figure 2-13. Full Former Repairs—Aft Pylon Structure Assembly (Sheet 1 of 2)

FULL FORMERS -- STATIONS 534 , 575.50, AND 594

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	△ CAP	BAC1506-1985 7075-T6	0.080 4130	2-7
	☐ CAP	HARVEY 17413 7075-T6	0.080 4130	--
2	ATTACHMENT	2014-T6 FORGING	NOTE B.	--
3	☐ PLATE	0.125 7075-T6 BARE	0.125 7075-T6 CLAD	--
4	ZEE	AND10138-1004 7075-T6	0.063 4130	--
5	TEE	REYNOLDS 26598 7075-T6	0.125 7075-T6 CLAD	--
6	CAP	BAC1514-539 7075-T6	0.100 4143	--
7	WEB	0.032 7075-T6 BARE	0.050 7075-T6 CLAD	--
8	ANGLE	0.090 7075-T6 BARE	0.090 7075-T6 CLAD	--
9	WEB	0.040 7075-T6 CLAD	0.050 2024-T3 CLAD	2-7
10	ANGLE	ALCOA 67580 7075-T6	0.063 4130	--
11	ANGLE	ALCOA 27076 7075-T6	0.063 4130	2-7
12	TEE	ALCOA 66517 7075-T6	0.063 4130	--
13	CHANNEL	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
14	WEB	0.050 2024-T4 CLAD	0.050 2024-T3 CLAD	--
15	ANGLE	VS70504-2 7075-T6	0.040 7075-T6 CLAD	--
16	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
17	CAP	ALCOA 15820 7075-T6	0.080 4130	--
18	EXTRUSION	BAC1520-1320	NOTE C.	--
19	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
20	CAP	HARVEY 17413 7075-T6	0.090 4130	--
21	SUPPORT	ZK60-T5 FORGING	NOTE D.	--
22	WEB	0.071 2024-T4 CLAD	0.071 2024-T3 CLAD	--
23	ANGLE	0.063 7075-T6 CLAD	0.071 7075-T6 CLAD	--

△ USED ON HELICOPTERS 66-19098 THROUGH 67-18441
☐ USED ON HELICOPTERS 67-18842 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW ATTACHMENT, 114A4801-1 IF DAMAGE IS OTHER THAN NEGLIGIBLE
C. REPAIR IS IMPRACTICAL. REPLACE WITH A NEW LENGTH OF ORIGINAL MATERIAL.
D. REPLACE WITH NEW SUPPORTS 114S4802-5 LH AND -7 RH IF DAMAGE IS OTHER THAN NEGLIGIBLE

42x39

B114-256-34SV ②

Figure 2-13. Full Former Repairs—Aft Pylon Structure Assembly (Sheet 2 of 2)

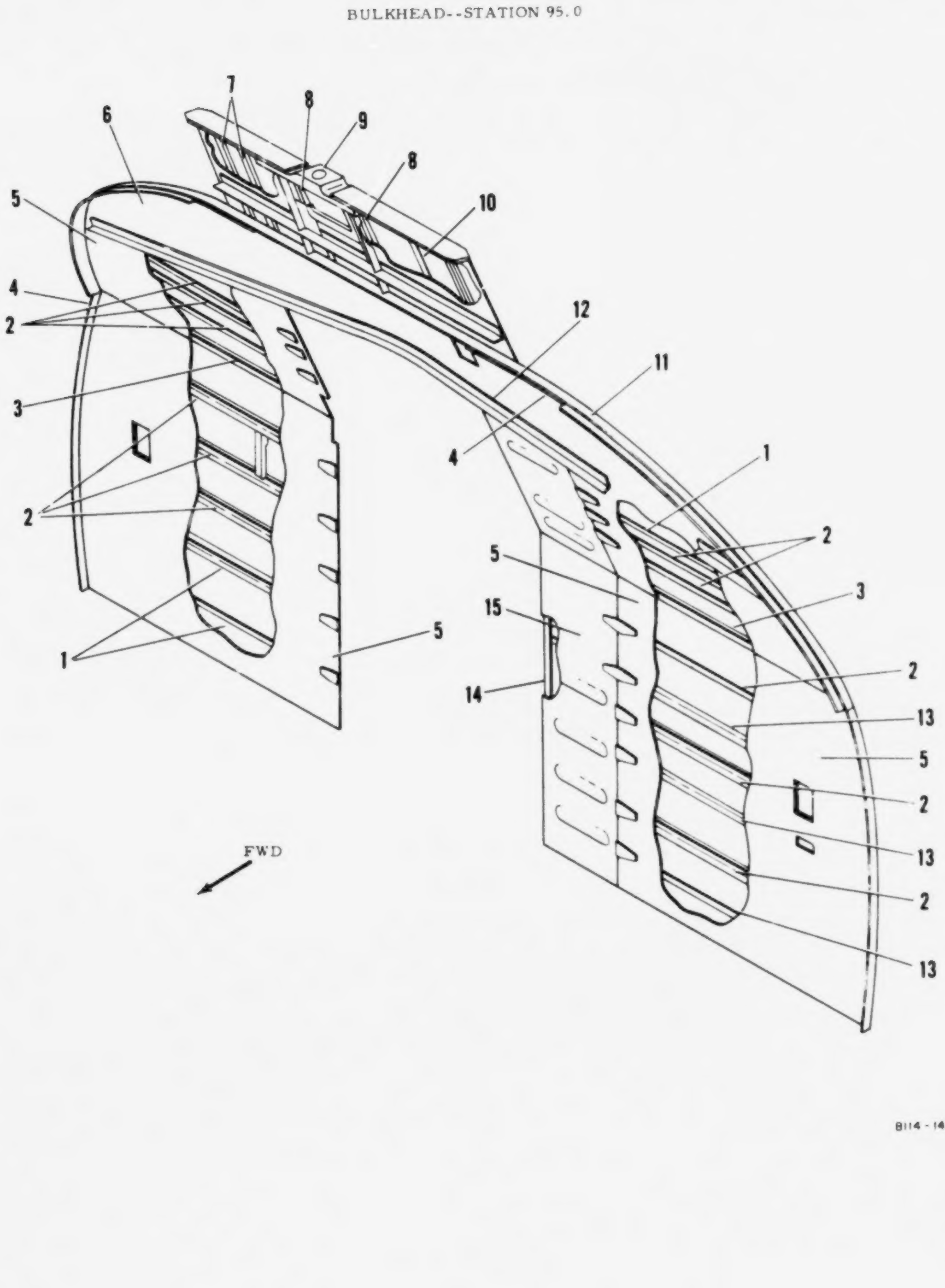

BULKHEAD--STATION 95.0
7
8
9
8
6
5
10
4
2
12
3
11
4
1
2
2
5
3
15
5
1
2
14
13
5
2
13
2
13
FWD
B114-148-35S

Figure 2-14. Bulkhead Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 2)

BULKHEAD--STATION 95.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STIFFENER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
2	STIFFENER	VS70503-3 7075-T6	0.050 7075-T6 CLAD	--
3	Z-SECTION	0.071 2024-T4 CLAD	0.071 2024-T3 CLAD	--
4	CAP	0.063 7075-T6 BARE	0.063 7075-T6 CLAD	--
5	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
6	WEB	0.071 7075-T6 BARE	0.071 7075-T6 CLAD	--
7	STIFFENER	ALCOA 51406 7075-T6	0.112 4130	--
8	STIFFENER	ALCOA 60654 7075-T6	0.160 4130	--
9	FITTING	2014-T6	NOTE B.	--
10	STIFFENER	0.071 2024-T4 CLAD	0.071 2024-T3 CLAD	--
11	CAP	ALCOA 16871 7075-T6	0.112 4130	--
12	CAP	AND10134-1407 7075-T6	0.160 4130	--
13	STIFFENER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-128
14	CAP	AND10133-0701 7075-T6	0.063 4130	--
15	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	2-7

NOTES

A. ALL DIMENSIONS ARE IN INCHES

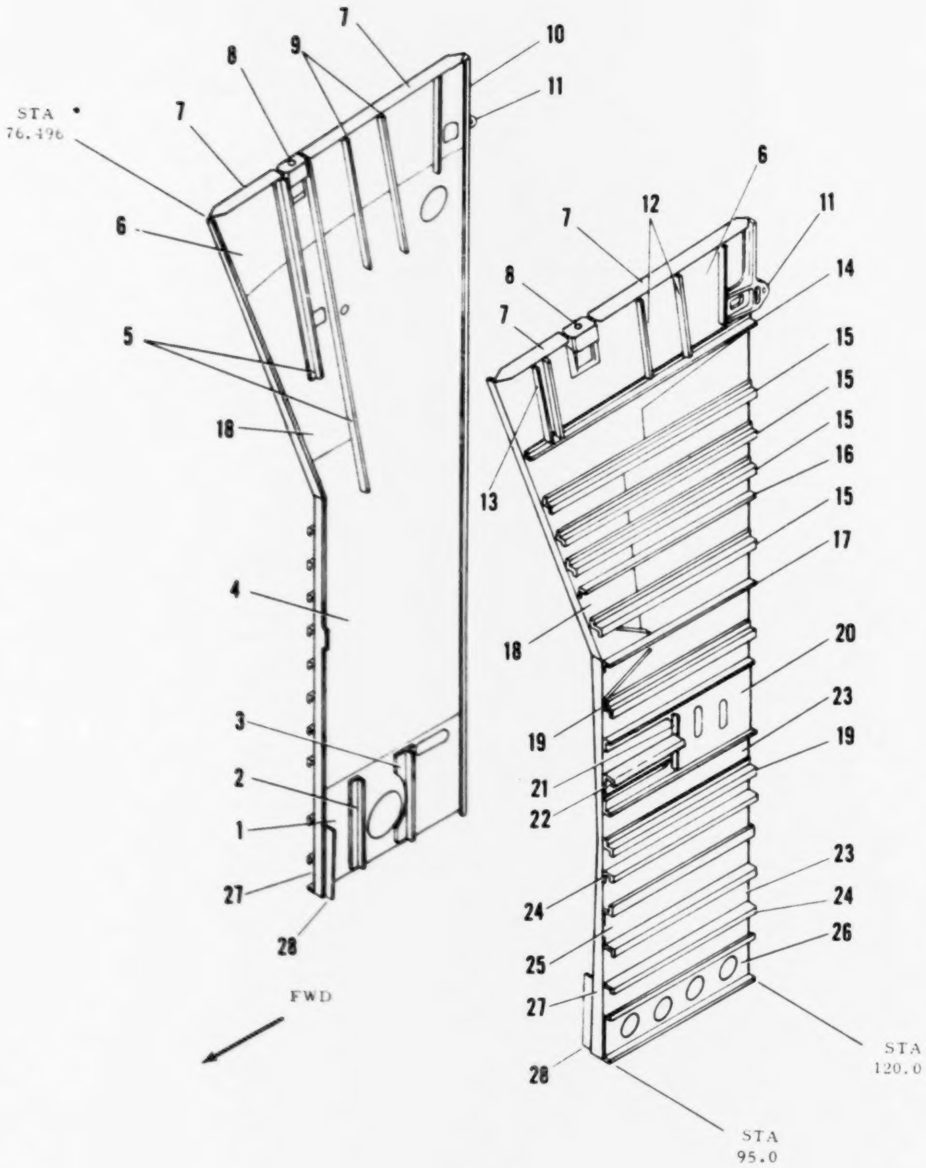
B. REPLACE WITH NEW FITTING 114S1801-1

42x21

B114 149 34S V

Figure 2-14. Bulkhead Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 2)

BEAMS--RIGHT AND LEFT SIDE BUTT LINES 18.0
BETWEEN STATIONS 95.0 AND 120.0


STA
76.496
7
8
9
7
10
11
6
5
18
4
3
2
1
27
28
FWD
6
7
12
11
8
7
14
15
15
15
16
15
17
13
18
20
19
23
21
19
22
23
24
24
26
25
27
28
STA
120.0
STA
95.0

B114-150-355

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 1 of 17)

BEAMS--RIGHT AND LEFT SIDE BUTT LINES 18.0
BETWEEN STATIONS 95.0 AND 120.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
2	STIFFENER	ALCOA 62564 7075-T6	0.080 4130	--
3	T-SECTION	ALCOA 32220 7075-T6	0.050 4130	--
4	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
5	STIFFENER	AND10134-1405 7075-T6	0.160 4130	--
6	WEB	0.032 301 3/4 H	0.040 301 3/4 H	2-7
7	STIFFENER	AND10134-2403 7075-T6	0.160 4130	--
8	FITTING	2014-T6	NOTE B.	--
9	STIFFENER	ALCOA 71369 7075-T6	0.080 4130	--
10	CAP	ALCOA 52985 7075-T6	0.160 4130	--
11	FITTING	2014-T6	NOTE C.	--
12	STIFFENER	ALCOA 71369 7075-T6	0.071 4130 STEEL	--
13	STIFFENER	0.071 7075-T6 BARE	0.080 7075-T6 CLAD	--
14	STIFFENER	REYNOLDS 19709 7075-T6	0.125 4130	--
15	STIFFENER	AND10139-0707 7075-T6	0.071 4130	--
16	STIFFENER	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
17	STIFFENER	AND10133-1202 7075-T6	0.100 4130	--
18	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
19	STIFFENER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
20	DOUBLER	0.080 2024-T4 CLAD	0.080 2024-T3 CLAD	--
21	STIFFENER	ALCOA 22477 7075-T6	0.040 4130	--
22	SUPPORT	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	--
23	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
24	CHANNEL	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
25	CHANNEL	0.050 2024-T4 BARE	0.063 2024-T4 CLAD	--
26	CHANNEL	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	--
27	CAP	AND10133-2003 7075-T6	0.190 4130	--
28	SUPPORT	--	NOTE D.	--

NOTES

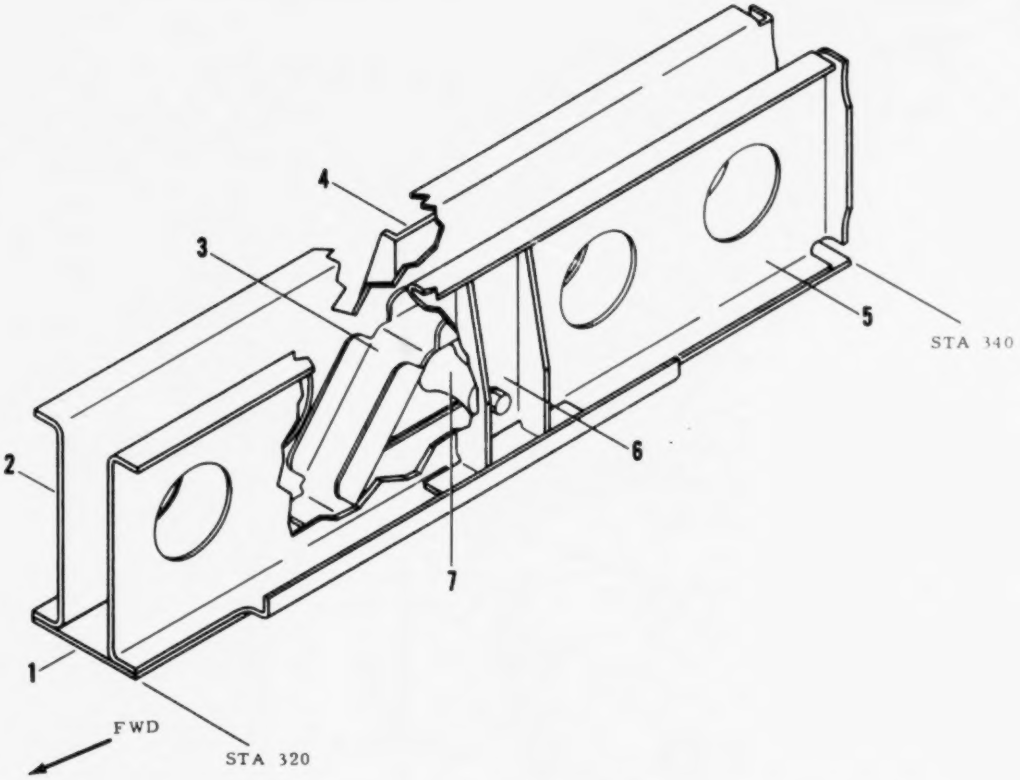
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW FITTING 114S1803-3
C. REPLACE WITH NEW FITTING 114S1813-1 LH
OR 114S1950-17 RH
D. REPLACE WITH NEW FITTING 114S1809-4

42x40

B114-151-34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 2 of 17)

RESCUE HOIST BEAM



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CLOSING PLATE	0.032 2024-T4 CLAD	0.032 2024-T3 CLAD
2	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
3	COVER	0.016 2024-T4 CLAD	0.025 2024-T3 CLAD
4	CHANNEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
5	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
6	CHANNEL	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
7	FITTING	1.0 DIA 7075-T6 RD BAR	NOTE B.

NOTES

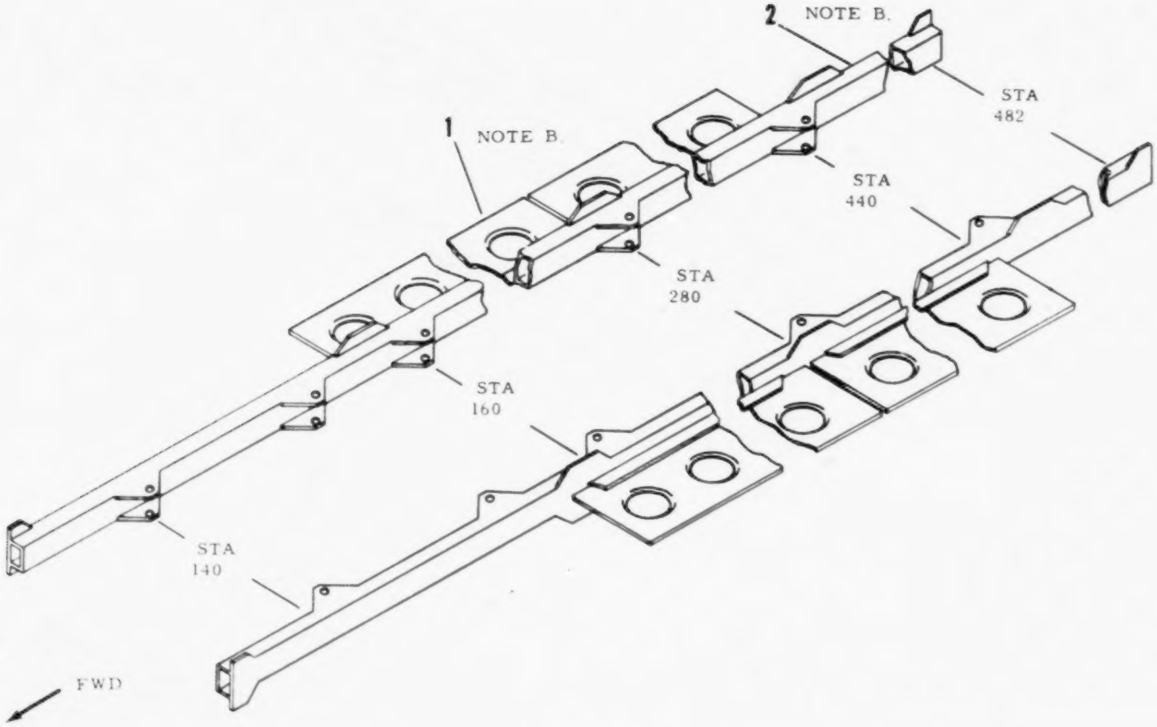
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW FITTING 114S2839-1

B114-124-34SV

42x51

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 3 of 17)

BEAMS--WATERLINE - 16



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-7
2	SEAT RAIL SUPPORT	VS90517 MAG ZK60A-T5	NOTE C.	--

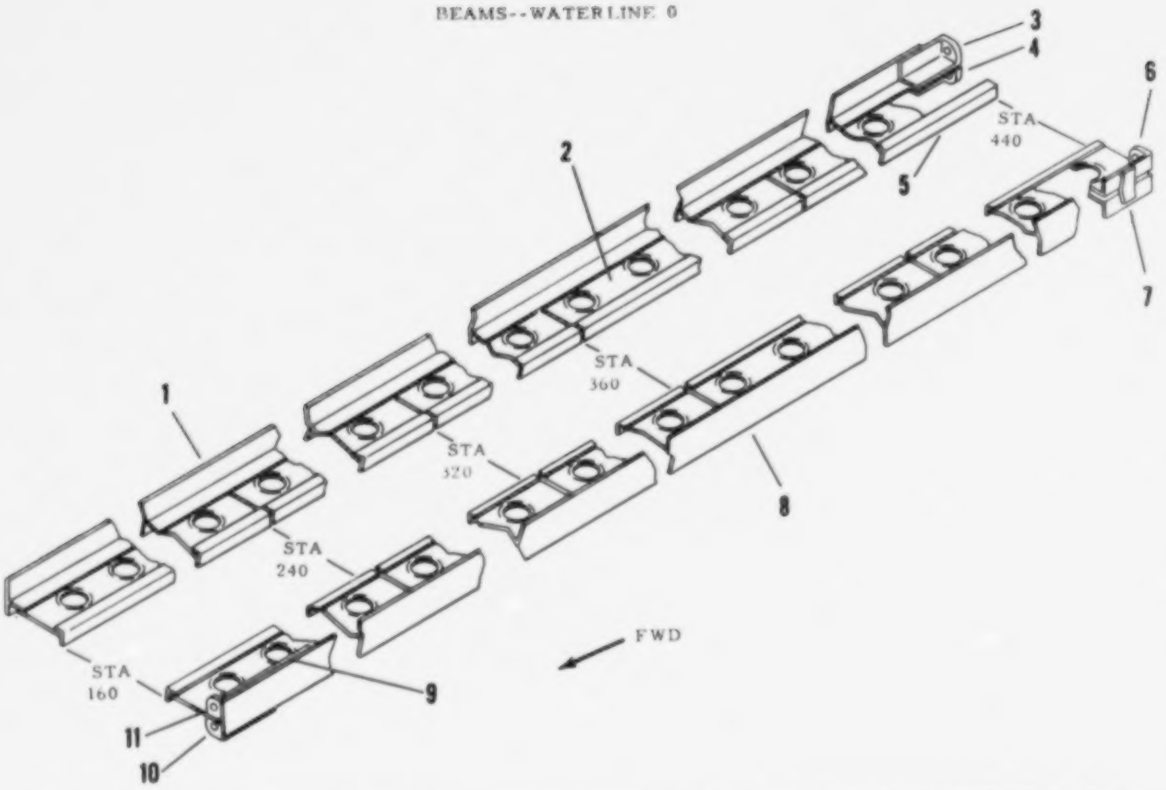
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. ALL WEBS AND SEAT RAIL SUPPORTS ARE SIMILAR IN CONSTRUCTION. ORIGINAL AND REPAIR MATERIALS, AND FIGURE REFERENCES ARE APPLICABLE TO ALL WEBS AND SEAT RAIL SUPPORTS
C. IF THE SEAT RAIL SUPPORT (2) IS DAMAGED, A LENGTH OF EXTRUSION, MACHINED TO THE CONFIGURATION OF THE ORIGINAL SECTION, SHOULD BE USED AS SHOWN IN FIG. 2-128

42x51

B114-125-34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 4 of 17)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STRINGER, RH	VS90315 7075-T6	0.090 4130	--
2	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
3	FITTING	7075-T6 EXTRUSION	NOTE C.	--
4	FITTING	7075-T6 EXTRUSION	NOTE D.	--
5	CAP	AND10133-0601 7075-T6	0.071 4130	--
6	FITTING	7075-T6 EXTRUSION	NOTE C.	--
7	FITTING	7075-T6 EXTRUSION	NOTE D.	--
8	STRINGER, LH	VS90315 7075-T6	0.090 4130	--
9	FILLER	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
10	FITTING	7075-T6 EXTRUSION	NOTE D.	--
11	FITTING	7075-T6 EXTRUSION	NOTE E.	--

NOTES

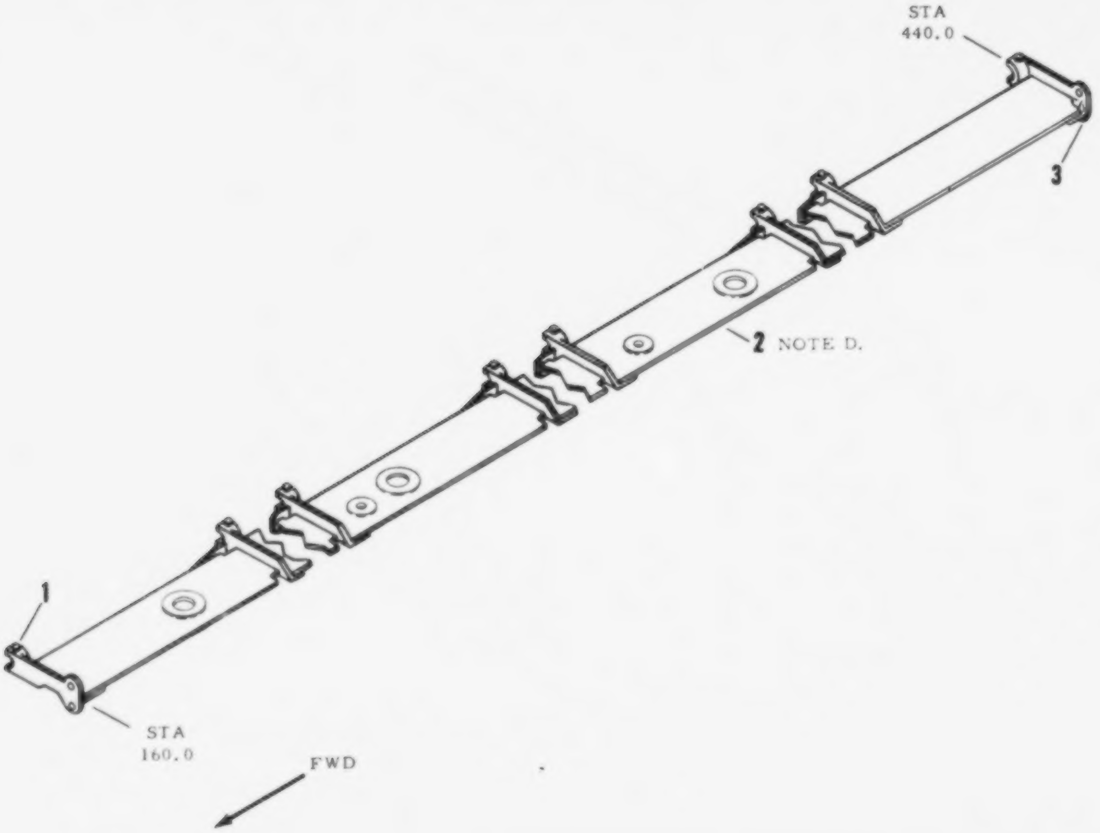
A. ALL DIMENSIONS ARE IN INCHES
B. ONLY ONE WEB (2) AND ONE CAP (5) ARE INDEXED. ALL WEBS AND CAPS ARE SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO SIMILAR PARTS
C. REPLACE WITH NEW FITTING 114S2818 -7LH OR -8RH
D. REPLACE WITH NEW FITTING 114S2818-9 LH OR -10 RH
E. REPLACE WITH NEW FITTING 114S2818-5

42x51

B114-126-34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 5 of 17)

TROOP SEAT BACKREST AND LITTER POLE BEAMS--WATERLINE+29.0



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	FITTING	7075-T6 FORGING	NOTE B.
2	BEAM	0.020 7075-T6 CLAD	0.032 7075-T6 CLAD
3	FITTING	7075-T6 FORGING	NOTE C.

NOTES

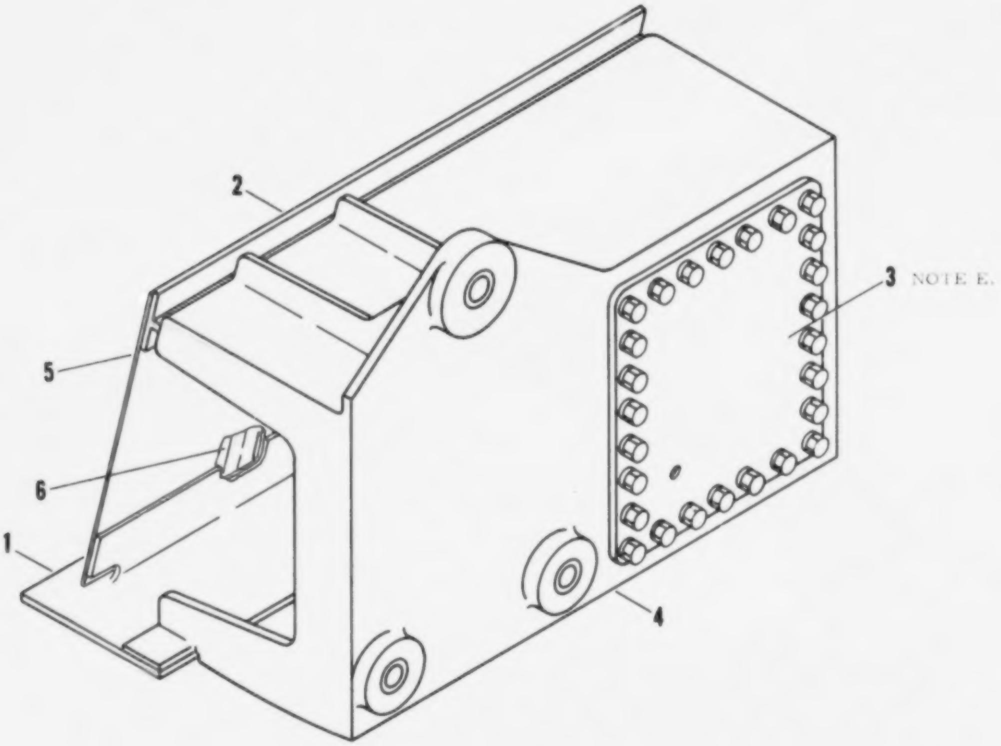
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW FITTING 114S2837-3 LH, OR -2 RH
C. REPLACE WITH NEW FITTING 114S2837-1 LH, OR -5 RH
D. THE LH BEAM IS SHOWN. THE RH BEAM IS SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO BOTH CONFIGURATIONS

42x51

B114-127-34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 6 of 17)

FORWARD LANDING GEAR SUPPORT BEAM



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	T-SECTION	VS90314 7075-T6	NOTE B.	--
2	T-SECTION	VS90311 7075-T6	NOTE B.	--
3	ACCESS DOOR	0.125 7075-T6 BARE	0.125 7075-T6 CLAD	2-7
4	FITTING ASSEMBLY	2014-T6 FORGING	NOTE C.	--
5	SKIN	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	2-7
6	ANGLE	AND10133-0601 7075-T6	0.063 4130	--

NOTES

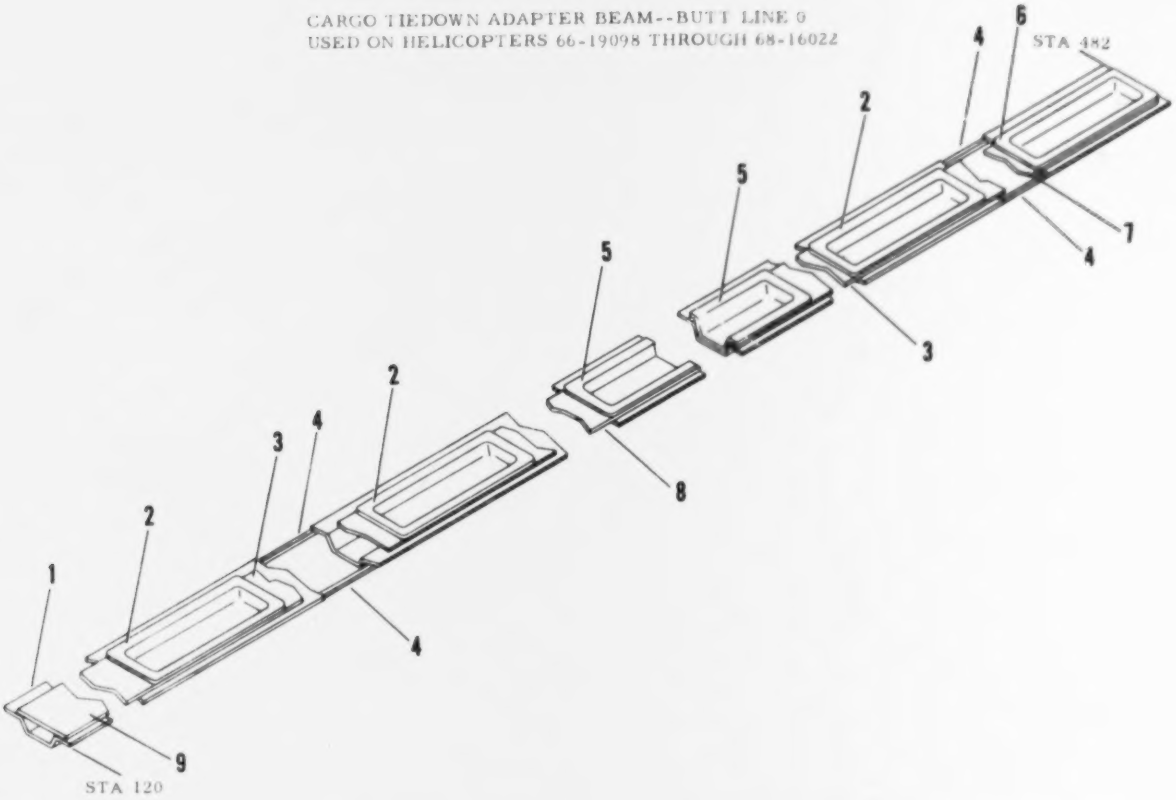
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW T-SECTION CORRESPONDINTO TO ORIGINAL MATERIAL
C. REPLACE WITH NEW FITTING 114S2813-1 LH, OR -2 RH
D. THE FAYING SURFACES OF ALL REPAIR AND REPLACEMENT PARTS AND ALL OPENINGS AND GAPS MUST BE SEALED AS DIRECTED IN PARA 2-554
E. PATCHING IS PERMISSIBLE. IF THE DAMAGE REQUIRES REPAIR BY INSERTION, THE ACCESS DOOR MUST BE REPLACED

42x51

B114 128 34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 7 of 17)

CARGO TIEDOWN ADAPTER BEAM--BUTT LINE 0
USED ON HELICOPTERS 66-19098 THROUGH 68-16022



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	BEAM	VS90575 MAG ZK60A-T5	NOTE B.	--
2	RECEPTACLE	0.032 6061-T6 BARE	NOTE C.	--
3	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
4	GANG CHANNEL	RM52LHTG51-02-J32	NOTE D.	--
5	RECEPTACLE	0.032 6061-T6 BARE	NOTE E.	--
6	RECEPTACLE	0.032 6061-T6 BARE	NOTE F.	--
7	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
8	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
9	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7

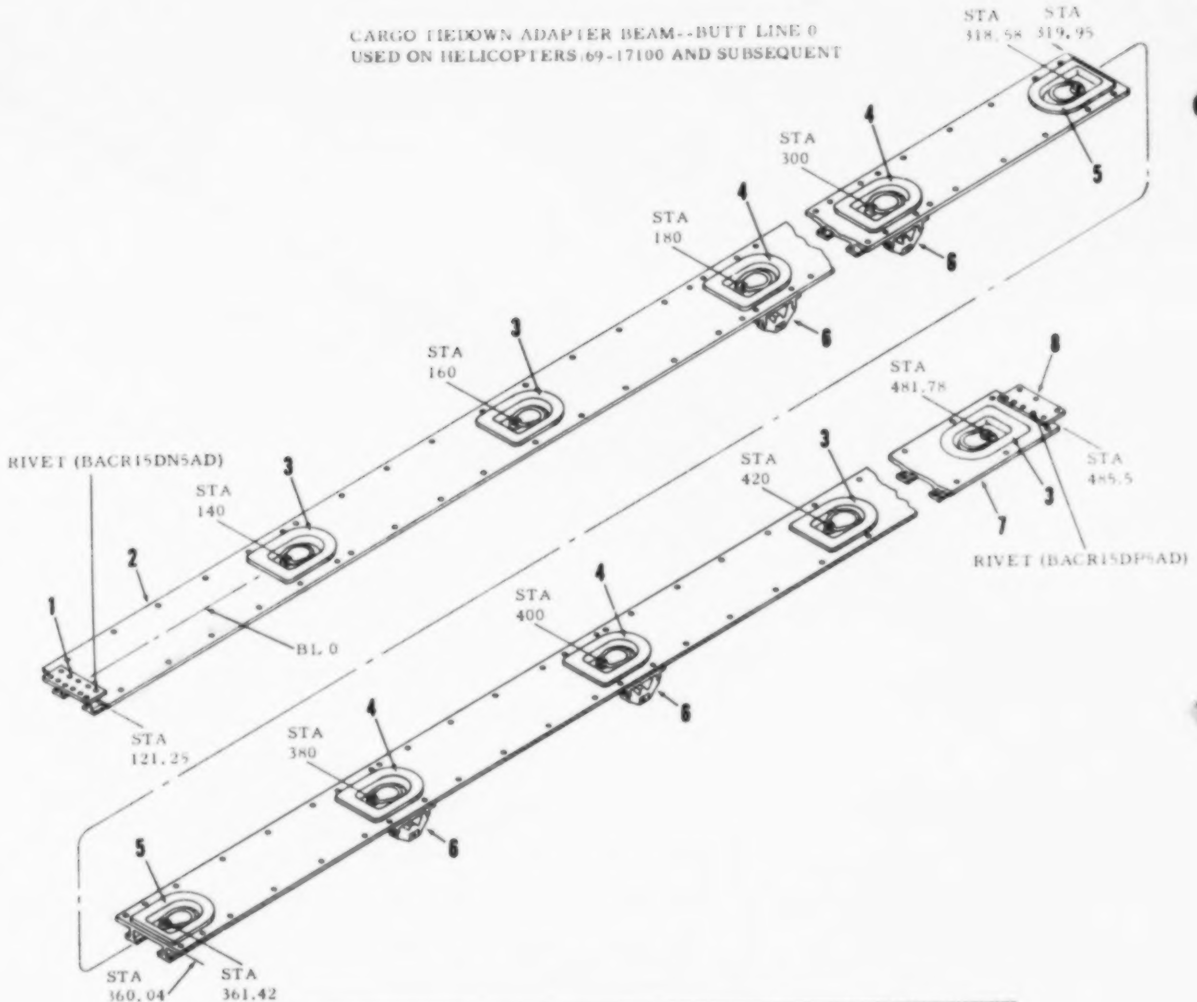
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPAIR DAMAGED BEAM AS DESCRIBED IN PARA 2-45
C. REPLACE WITH NEW RECEPTACLE 114S2701-1
D. REPLACE DAMAGED SECTION WITH SIMILAR LENGTH GANG CHANNEL
E. REPLACE WITH NEW RECEPTACLE 114S2704-1
F. REPLACE WITH NEW RECEPTACLE 114S2712-1
G. THE FAYING SURFACES OF REPAIR PARTS SHOULD BE ASSEMBLED WITH MYLAR TAPE AS DIRECTED IN PARA 2-554
H. PLATE AND RECEPTACLES NOT SHOWN BECAUSE OF BROKEN AREA, ARE INDEX NO. (3) AND (2) RESPECTIVELY

42x52

B114 129 34SV

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 8 of 17)


CARGO TIEDOWN ADAPTER BEAM--BUTT LINE 0
USED ON HELICOPTERS 69-17100 AND SUBSEQUENT
STA 318.58
STA 319.95
5
4
STA 300
6
4
STA 180
6
3
STA 160
8
STA 481.78
STA 485.5
3
7
RIVET (BACR15DP5AD)
RIVET (BACR15DN5AD)
3
STA 140
2
1
BL 0
STA 121.25
STA 420
3
4
STA 400
6
4
STA 380
6
5
STA 360.04
STA 361.42

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	PLATE	0.100 2024-T3 CLAD	NOTE J.
2	BEAM	2024-T4 BARE	NOTE D.
3	RECEPTACLE	7075-T6 BARE	NOTE E.
4	RECEPTACLE	7075-T6 BARE	NOTE F.
5	RECEPTACLE	7075-T6 BARE	NOTE G.
6	MOUNT	--	NOTE H.
7	BEAM	2024-T4 BARE	NOTE I.
8	PLATE	0.050 2024-T3 CLAD	NOTE J.

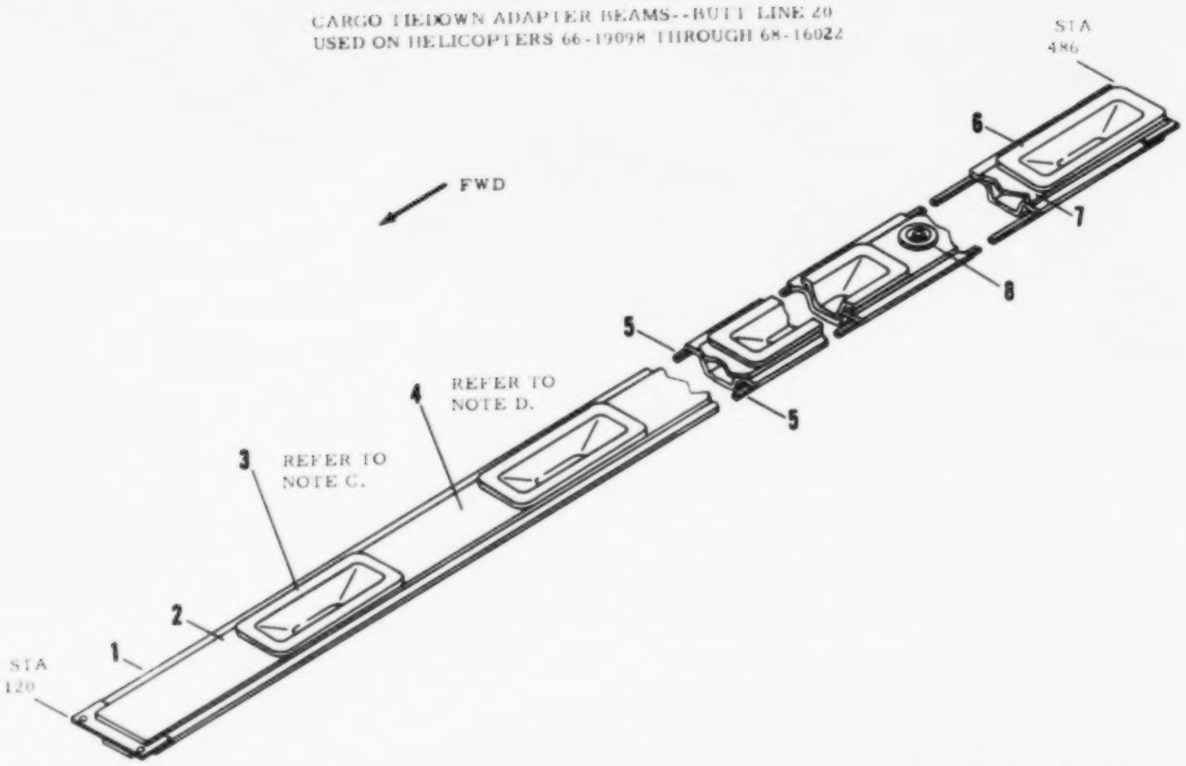
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. ALL RECEPTACLES BETWEEN STATIONS 180 AND 300 ARE 114S2893-7
C. ALL RECEPTACLES BETWEEN STATIONS 420 AND 481.78 ARE 114S2893-12
D. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW BEAM 114S2567-2
E. REPLACE WITH NEW RECEPTACLE 114S2893-12
F. REPLACE WITH NEW RECEPTACLE 114S2893-7
G. REPLACE WITH NEW RECEPTACLE 114S2893-8
H. REPLACE WITH NEW MOUNT 114SS669-1
I. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW BEAM 114S2568-2
J. REPLACE WITH NEW PART SAME AS ORIGINAL

42x51

B114-314-345V

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 9 of 17)


CARGO TIEDOWN ADAPTER BEAMS--BUTT LINE 20
USED ON HELICOPTERS 66-19098 THROUGH 68-16022
STA 486
6
FWD
7
8
5
REFER TO NOTE D.
4
5
3
REFER TO NOTE C.
2
1
STA 120

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	BEAM	VS90575 MAG AK60A-T5	NOTE D.	--
2	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
3	RECEPTACLE	0.032 6061-T6 BARE	NOTE E.	--
4	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
5	GANG CHANNEL	RM52LHTG51-02-J32	NOTE F.	--
6	RECEPTACLE	0.032 6061-T6 BARE	NOTE G.	--
7	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
8	ADAPTER ASSEMBLY	--	NOTE H.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE LH BEAM IS SHOWN, THE RH BEAM IS SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO BOTH CONFIGURATIONS

C. ALL PLATES AND RECEPTACLES ARE SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO ALL PLATES AND RECEPTACLES

D. REPAIR DAMAGED BEAM AS DESCRIBED IN PARA 2-45.

E. REPLACE WITH NEW RECEPTACLE 114S2701-1

F. REPLACE DAMAGED SECTION WITH A SIMILAR LENGTH GANG CHANNEL

G. REPLACE WITH NEW RECEPTACLE 114S2712-1

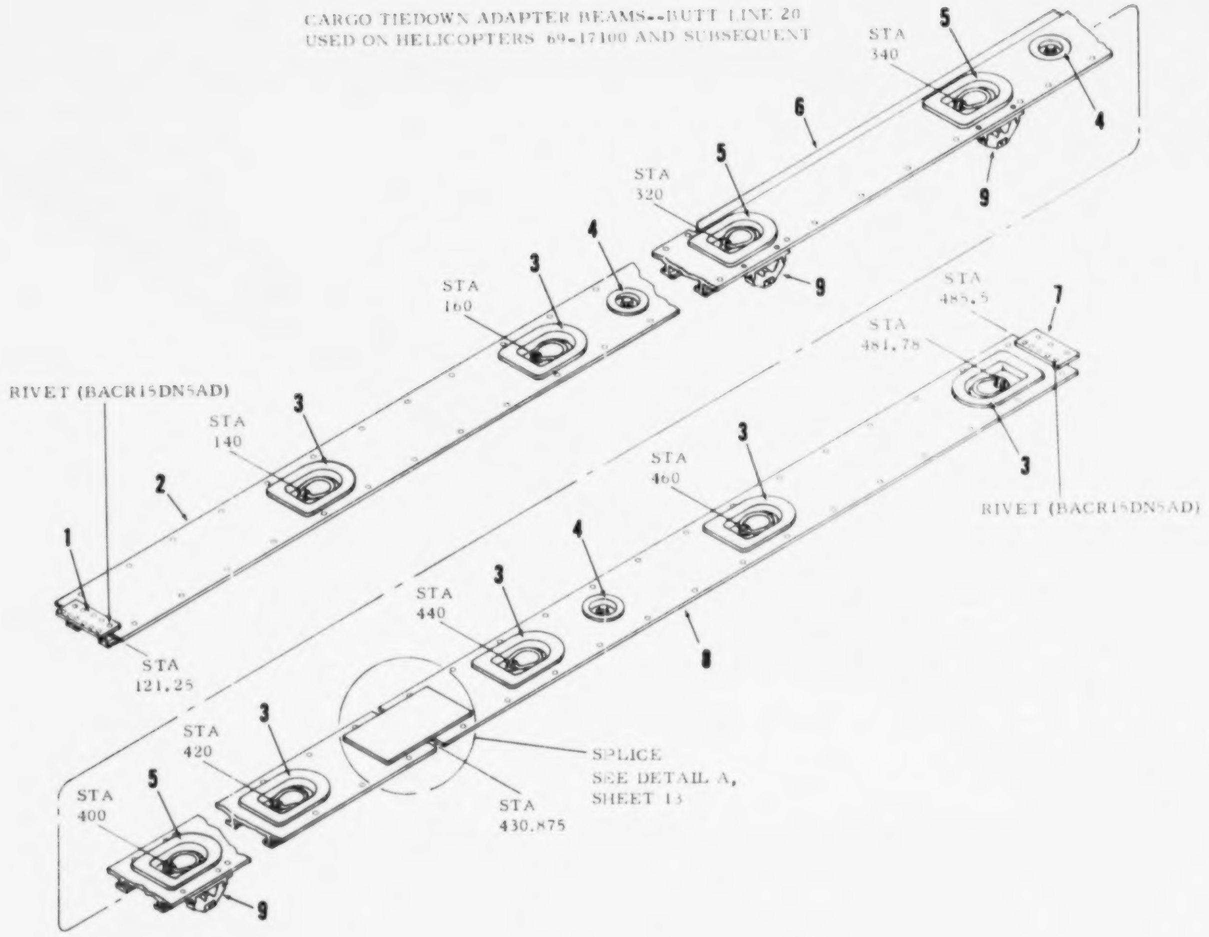
H. REPLACE WITH NEW ADAPTER ASSEMBLY 114S2559-55

I. THE FAYING SURFACES OF REPAIR PARTS SHOULD BE SEALED AS DIRECTED IN PARA 2-554.

B114 130 34SV

42x48

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 10 of 17)


CARGO TIEDOWN ADAPTER BEAMS--BUTT LINE 20
USED ON HELICOPTERS 69-17100 AND SUBSEQUENT
STA 340
5
4
6
9
STA 320
5
9
4
3
STA 160
STA 485.5
7
STA 481.78
RIVET (BACR15DN5AD)
3
STA 140
2
3
RIVET (BACR15DN5AD)
STA 460
3
1
4
STA 440
3
8
STA 121.25
STA 420
3
SPLICE
SEE DETAIL A,
SHEET 13
STA 400
5
STA 430.875
9

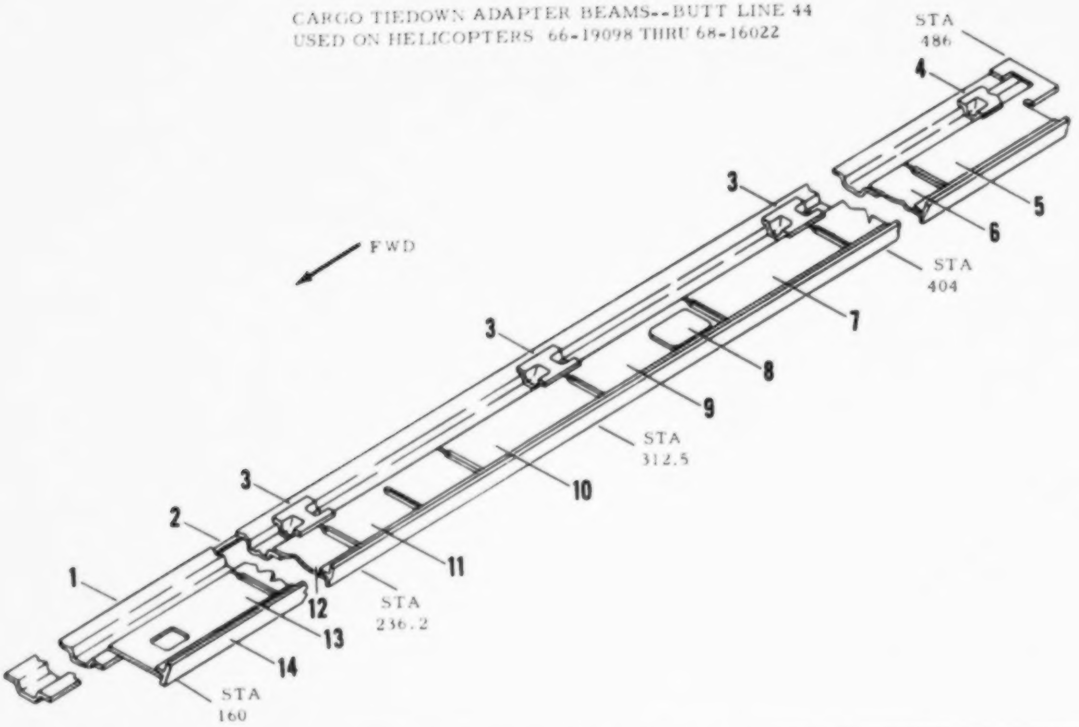
INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	PLATE	0.100 2024-T3 CLAD	NOTE I.
2	BEAM	2024-T4 BARE	NOTE C.
3	RECEPTACLE	7075-T6 BARE	NOTE D.
4	ADAPTER	--	NOTE E.
5	RECEPTACLE	7075-T6 BARE	NOTE F.
6	SEAL SUPPORT	BAC1517-1459 7075-T6	0.063 4130
7	PLATE	0.050 2024-T3 CLAD	NOTE I.
8	BEAM	2024-T4 BARE	NOTE G.
9	MOUNT	--	NOTE H.

A. ALL DIMENSIONS ARE IN INCHES
B. ALL RECEPTACLES BETWEEN STA 180 AND 400 ARE 114S2893-7
C. REPLACE BEAM IF DAMAGE IS OTHER THAN NEGLIGIBLE WITH NEW BEAM 114S2569-4 LH OR -5 RH
D. REPLACE WITH NEW RECEPTACLE 114S2893-12
E. REPLACE WITH NEW ADAPTER 114S2559-55
F. REPLACE WITH NEW RECEPTACLE 114S2893-7
G. REPLACE BEAM IF DAMAGE IS OTHER THAN NEGLIGIBLE WITH NEW BEAM 114S2569-6 LH AND RH
H. REPLACE WITH NEW MOUNT 114SS669-1
I. REPLACE WITH NEW PART SAME MATERIAL AS ORIGINAL

42x50

B114-315-345V

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 11 of 17)



CARGO TIEDOWN ADAPTER BEAMS--BUTT LINE 44
USED ON HELICOPTERS 66-19098 THRU 68-16022

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	BEAM	VS90575 MAG ZK60A-T5	NOTE C.	--
2	GANG CHANNEL	RM52LHTG51-02-J32'	NOTE D.	--
3	RECEPTACLE	--	NOTE G.	--
4	RECEPTACLE	--	NOTE H.	--
5	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
6	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
7	PLATE	0.050 MAG AZ31B-H24	0.050 MAG AZ31B-H24	2-7
8	ACCESS PANEL	0.100 MAG AZ31B-H24	NOTE E.	--
9	PLATE	0.050 MAG AZ31B-H24	0.050 MAG AZ31B-H24	2-7
10	PLATE	0.050 MAG AZ31B-H24	0.050 MAG AZ31B-H24	2-7
11	PLATE	0.050 MAG AZ31B-H24	0.050 MAG AZ31B-H24	2-7
12	PLATE	0.050 MAG AZ31B-H24	0.050 MAG AZ31B-H24	2-7
13	PLATE	0.063 MAG AZ31B-H24	0.063 MAG AZ31B-H24	2-7
14	LONGERON	VS93305 7075-T6	0.100 4130	--

NOTES

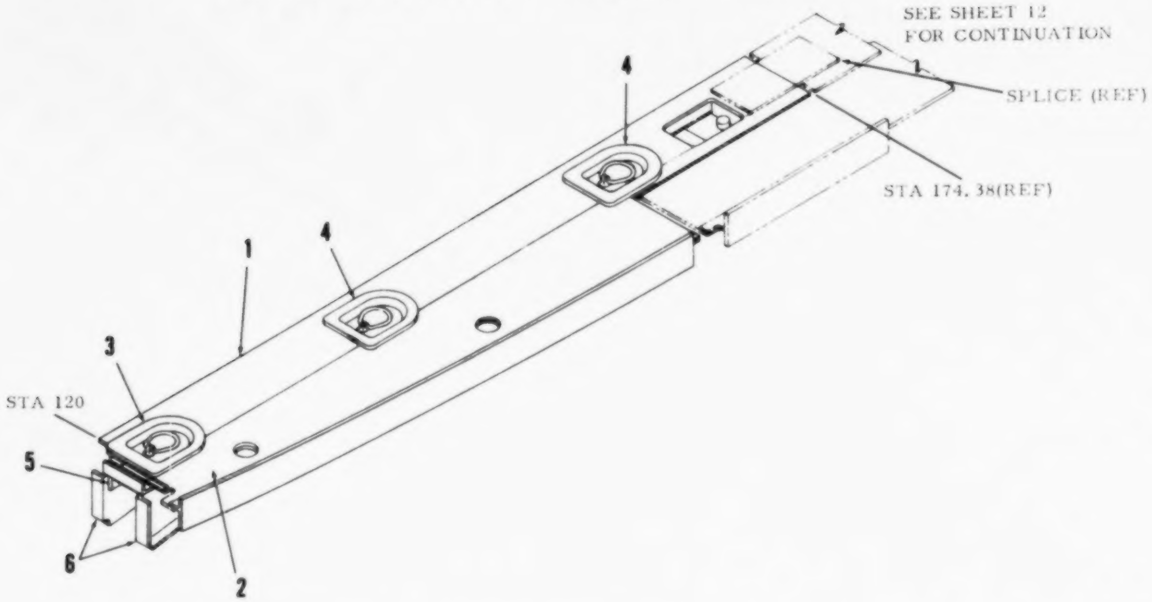
A. ALL DIMENSIONS ARE IN INCHES
B. THE LH BEAM IS SHOWN. THE RH BEAM IS SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO BOTH CONFIGURATIONS
C. REPAIR DAMAGED BEAM AS DESCRIBED IN PARA 2-45
D. REPLACE DAMAGED SECTION WITH A SECTION CORRESPONDING TO THE ORIGINAL
E. REPLACE WITH A NEW ACCESS PANEL 114SS657-1
F. THE FAYING SURFACES OF REPAIR PARTS SHOULD BE SEALED AS DIRECTED IN PARA 2-554
G. REPLACE WITH A NEW RECEPTACLE 114S2727-1
H. REPLACE WITH A NEW RECEPTACLE 114S2727-3

B114 131 345V

42x48

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 12 of 17)

CARGO TIEDOWN ADAPTER BEAM--BUTT LINE 44
USED ON HELICOPTERS SERIAL NO. 69-17100 AND SUBSEQUENT



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BEAM	2024-T4 BARE	NOTE B.
2	PLATE	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD
3	RECEPTACLE	7075-T6 BARE	NOTE C.
4	RECEPTACLE	7075-T6 BARE	NOTE D.
5	CHANNEL	AND 10137-2405 7075-T6	NOTE E.
6	BRACKET	0.050 7075-T6 BARE	NOTE E.

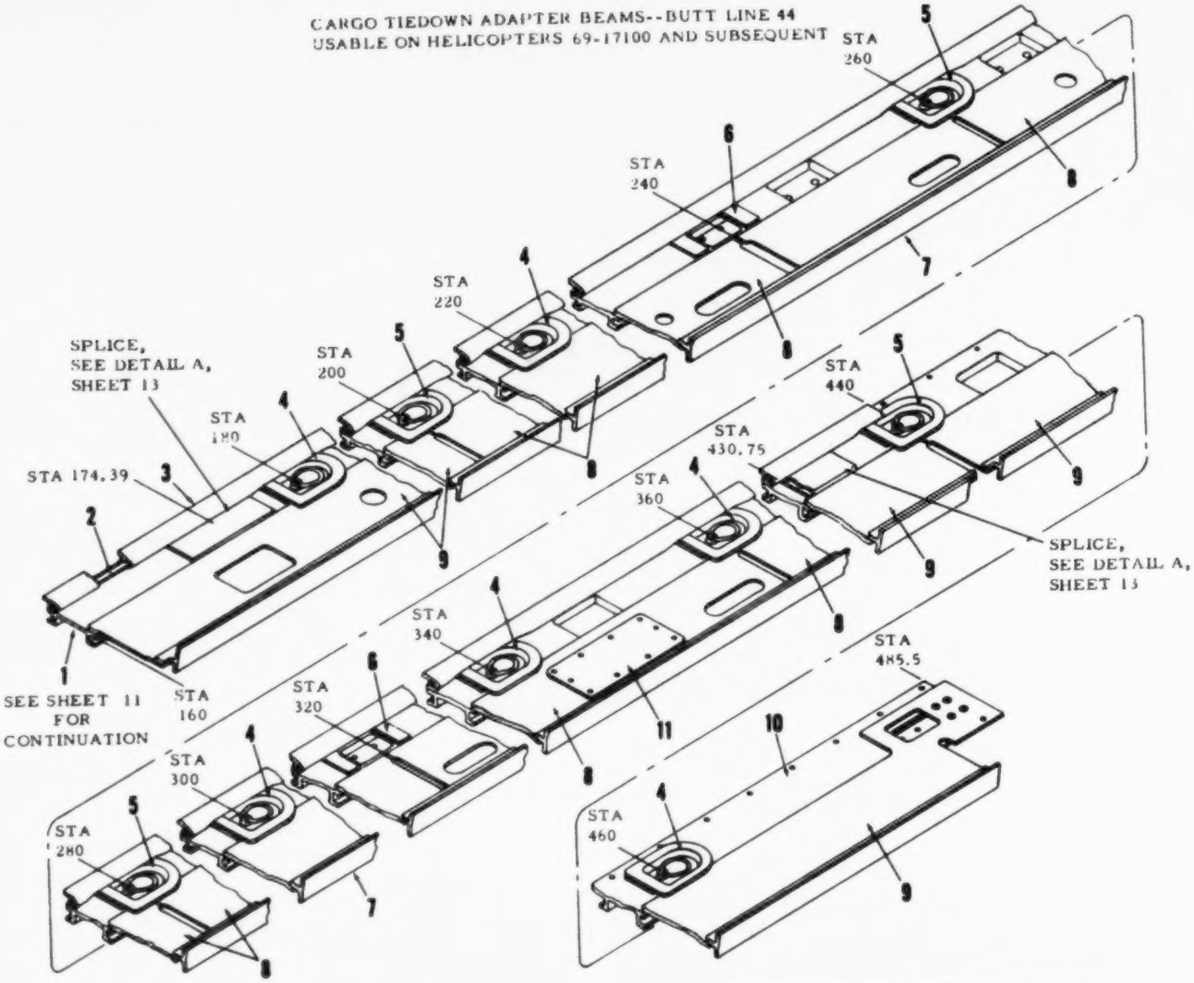
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW BEAM 114S1555-30 LH OR -31 RH
C. REPLACE WITH NEW RECEPTACLE 114S2893-15
D. REPLACE WITH NEW RECEPTACLE 114S2893-13
E. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW PART SAME AS ORIGINAL.

42x41

B114-367-345V

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 13 of 17)


CARGO TIEDOWN ADAPTER BEAMS--BUTT LINE 44
USABLE ON HELICOPTERS 69-17100 AND SUBSEQUENT
STA 260
5
6
STA 240
8
7
STA 220
4
8
SPLICE, SEE DETAIL A, SHEET 13
STA 200
5
8
STA 180
4
STA 174.39
3
2
9
1
SEE SHEET 11 FOR CONTINUATION
STA 160
STA 440
5
STA 430.75
9
SPLICE, SEE DETAIL A, SHEET 13
STA 360
4
9
8
STA 340
4
11
STA 485.5
10
STA 320
6
8
STA 300
4
STA 280
5
7
8
STA 460
4
9

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	BEAM	2024-T4 BARE	NOTE B.	--
2	RETAINER	0.032 2024-T3 CLAD	0.032 2024-T3 CLAD	--
3	SEAL	0.063 URETHANE SHEET	0.063 URETHANE SHEET	2-130
4	RECEPTACLE	7075-T6 BARE	NOTE C.	--
5	RECEPTACLE	7075-T6 BARE	NOTE D.	--
6	SPACER	0.040 2024-T3 CLAD	0.040 2024-T3 CLAD	--
7	LONGERON	VS90305 7075-T6	0.100 4130	--
8	PLATE	0.040 7075-T6 CLAD	0.040 7075-T6	--
9	PLATE	0.050 7075-T6 CLAD	0.050 7075-T6	--
10	BEAM	2024-T4 BARE	NOTE E.	--
11	ACCESS PANEL	0.100 MAG AZ31B-H24	NOTE F.	--

NOTES

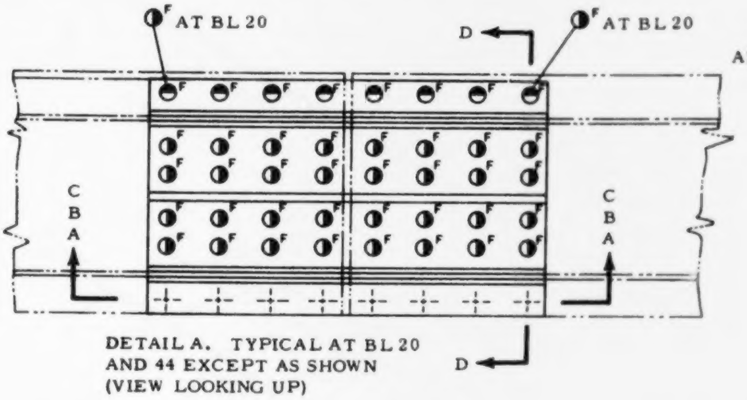
A. ALL DIMENSIONS ARE IN INCHES
B. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW BEAM 114S2570-49 LH OR -14 RH
C. REPLACE WITH NEW RECEPTACLE 114S2893-14
D. REPLACE WITH NEW RECEPTACLE 114S2893-9 LH OR -18 RH
E. FOR DAMAGE OTHER THAN NEGLIGIBLE REPLACE WITH NEW BEAM 114S2570-51 LH OR -52 RH
F. REPLACE WITH NEW ACCESS PANEL 114S5657-1
G. BETWEEN STA 360 AND 420 ALL RECEPTACLES ARE 114S2893-14

B114-316-34SV

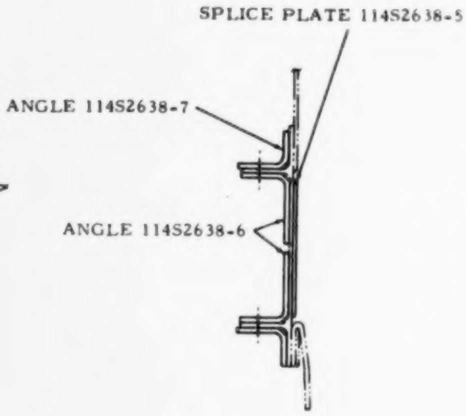
42x52

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 14 of 17)

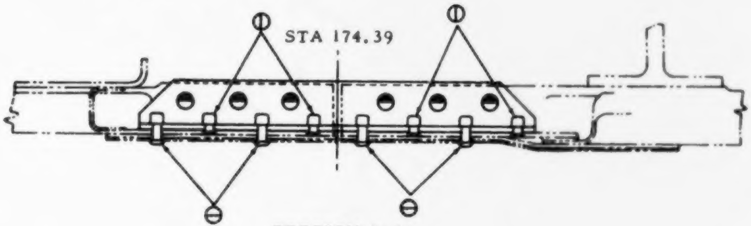
ALUMINUM FLOOR BEAM SPLICES


F AT BL 20
D
F AT BL 20
C
B
A
C
B
A
D

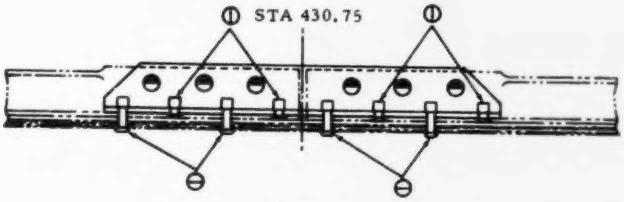
DETAIL A. TYPICAL AT BL 20
AND 44 EXCEPT AS SHOWN
(VIEW LOOKING UP)


SPLICE PLATE 114S2638-5
ANGLE 114S2638-7
ANGLE 114S2638-6

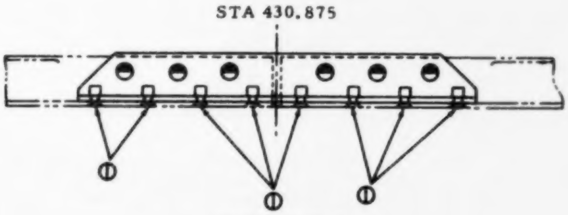
SECTION D-D
(TYPICAL)



SECTION A-A
(FOR BL 44)



SECTION B-B
(FOR BL 44)



SECTION C-C
(FOR BL 20)

NOTES

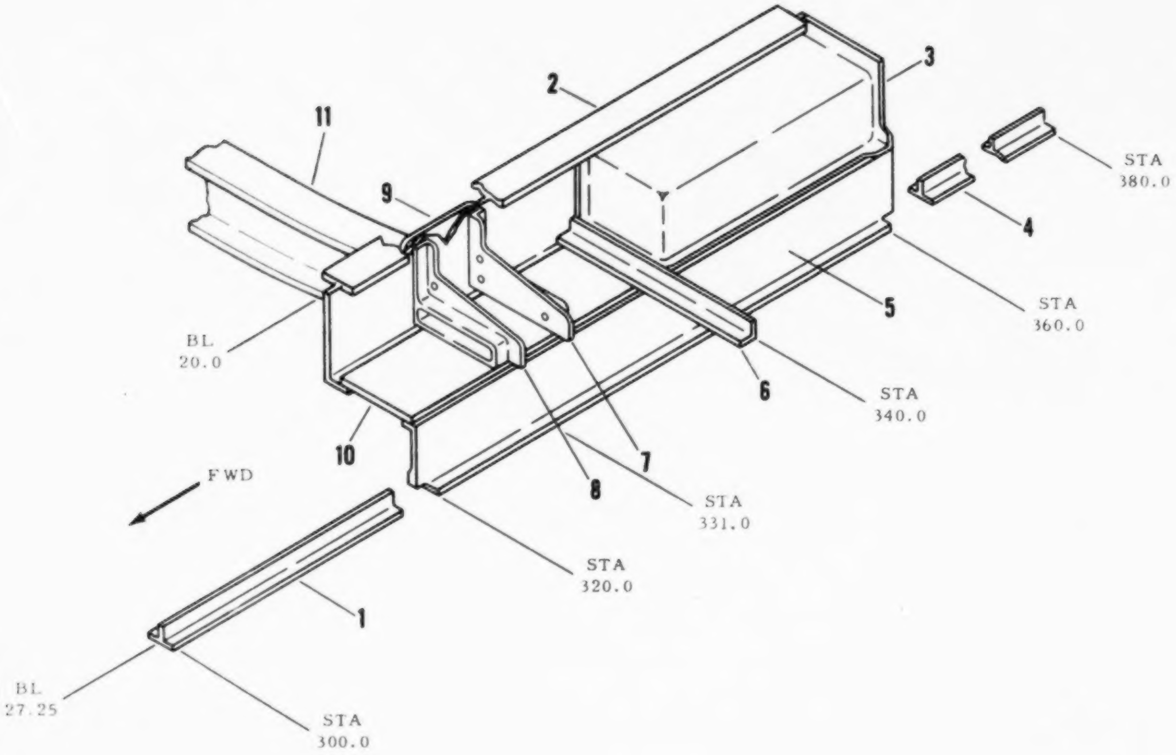
A. ALL DIMENSIONS ARE IN INCHES
B. RIVET SYMBOLS
- ◑ NAS1465-3 AND NAS1080-5
- ◒ NAS1465-4 AND NAS1080-5
- ⊖ NAS1465-6 AND NAS1080-5
- ⦶ NAS1475-3 AND NAS1080-5

42x49

B114-368-34S

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 15 of 17)

RESCUE HOIST CUTOUT BEAMS



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	AND10136-2006 7075-T6	0.160 4130	--
2	BEAM	VS90537 7075-T6	0.250 4130	--
3	COVER	--	NOTE C.	--
4	CAP	AND10136-2006 7075-T6	0.160 4130	--
5	BEAM	VS90538 7075-T6		--
6	CLIP	ALCOA 33811 7075-T6	0.125 4130	--
7	FITTING	--	NOTE D.	--
8	FITTING	--	NOTE E.	--
9	FITTING	--	NOTE F.	--
10	WEB	0.125 7075-T6 CLAD	0.125 7075-T6 CLAD	2-7
11	BEAM TRACK	--	NOTE G.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE LH BEAM IS SHOWN. THE RH BEAM IS SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO BOTH CONFIGURATIONS

C. THE COVER IS MADE OF FOUR PLIES OF PLASTIC-IMPREGNATED GLASS CLOTH. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR TYPICAL REPAIRS TO IMPREGNATED GLASS CLOTH PARTS

D. REPLACE WITH NEW FITTING 114S2841-1

E. REPLACE WITH NEW FITTING 114S2841-2

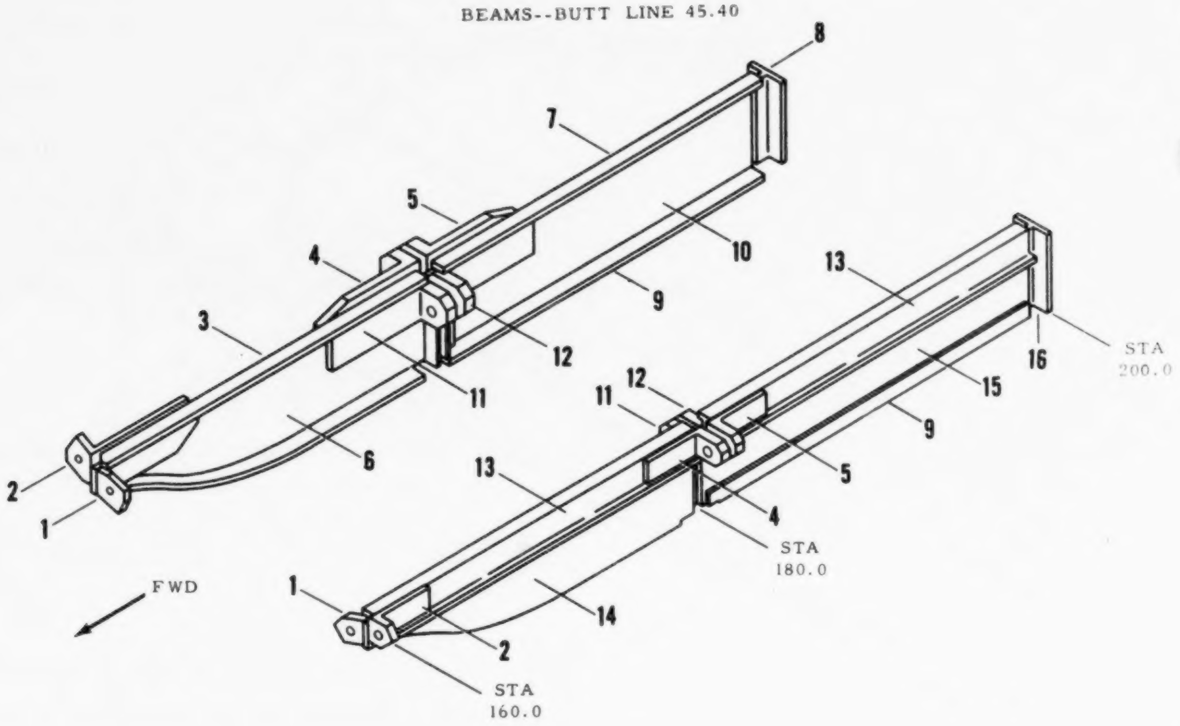
F. FITTING (SUPPORT 114S2834) REFER TO PARA 16-128 FOR WEAR TOLERANCES

G. BEAM TRACK 114E5063, REFER TO PARA 16-128 FOR WEAR TOLERANCES

42x51

B114-132 34SM

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 16 of 17)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FITTING	--	NOTE B.	--
2	FITTING	--	NOTE B.	--
3	CAP	REYNOLDS 10270 7075-T6	0.160 4130	2-7
4	FITTING	--	NOTE B.	--
5	FITTING	--	NOTE B.	--
6	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
7	CAP	REYNOLDS 10270 7075-T6	0.160 4130	--
8	CLIP	AND10136-2001 7075-T6	NOTE C.	--
9	CAP	ALCOA 62564 7075-T6	0.090 4130	--
10	WEB	0.071 7075-T6 CLAD	0.071 7075-T6 CLAD	2-7
11	FITTING	--	NOTE B.	--
12	FITTING	--	NOTE B.	--
13	CAP	ALCOA 85491 7075-T6	0.160 4130	--
14	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
15	WEB	0.063 7075-T6 CLAD	0.063 7075-T6 CLAD	2-7
16	CLIP	ALCOA 62564 7075-T6	NOTE C.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE FITTINGS (1, 2, 4, 5, 11, AND 12) WITH NEW PARTS:
- (1) 114S2840-11 RH AND - 1 LH
- (2) 114S2840-21 RH AND -19 LH
- (4) 114S2840-23 RH AND - 5 LH
- (5) 114S2840-25 RH AND - 6 LH
- (11) 114S2840-27 RH AND -5 LH
- (12) 114S2840-28 RH AND -7 LH

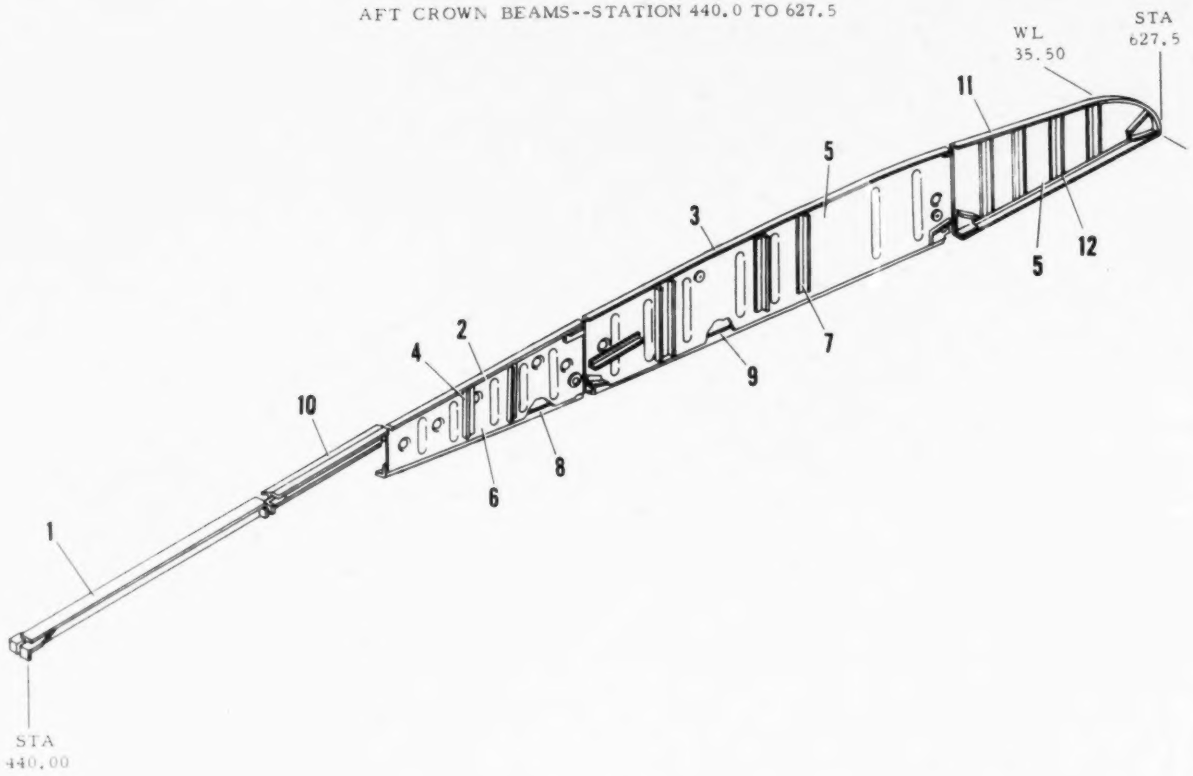
C. REPLACE CLIPS WITH A CORRESPONDING LENGTH OF THE SAME TYPE EXTRUSION AS ORIGINAL

42x51

B114 133 34S

Figure 2-15. Beam Repairs—Fuselage Structure Assembly (Sheet 17 of 17)

AFT FUSELAGE STRUCTURE ASSEMBLY
AFT CROWN BEAMS--STATION 440.0 TO 627.5



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	STRINGER	AND 10136-1406 7075-T6	0.100 4130	--
2	CAP	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	--
3	CAP	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	--
4	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
5	WEB	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
6	WEB	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
7	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
8	CAP	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
9	CAP	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
10	ANGLE	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	--
11	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
12	STIFFENER	VS70504-2 7075-T6	0.032 7075-T6 CLAD	--

NOTES

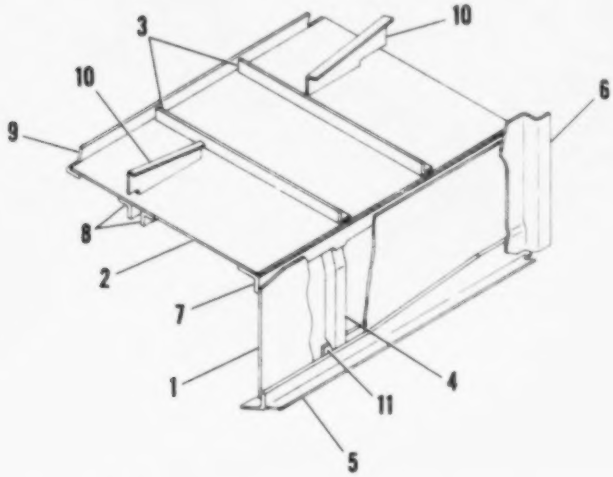
A. ALL DIMENSIONS SHOWN IN INCHES
B. THE LEFT-HAND BEAM IS SHOWN. REPAIR MATERIALS AND REFERENCED REPAIR FIGURES ARE THE SAME FOR THE RIGHT-HAND BEAM

42 x 51

B114-207-34S

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 1 of 6)

AFT FUSELAGE STRUCTURE ASSEMBLY
AFT LANDING GEAR DRAG BEAM--STATION 460 TO 482



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
2	WEB	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	2-7
3	STIFFENER	AND10133-0603 7075-T6	0.125 4130	--
4	STIFFENER	AND10133-0602 7075-T6	0.100 4130	--
5	CAP	VS90533 7075-T6	NOTE B.	--
6	ZEE	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	--
7	CAP	BAC1514-157 7075-T6	NOTE B.	--
8	CAP	ALCOA 29222 7075-T6	0.200 4130	--
9	CAP	VS90305 7075-T6	0.063 4130	--
10	BRACKET	0.063 2024-T3 CLAD	0.071 2024-T3 CLAD	--
11	STIFFENER	VS90533 7075-T6	NOTE B.	--

NOTES

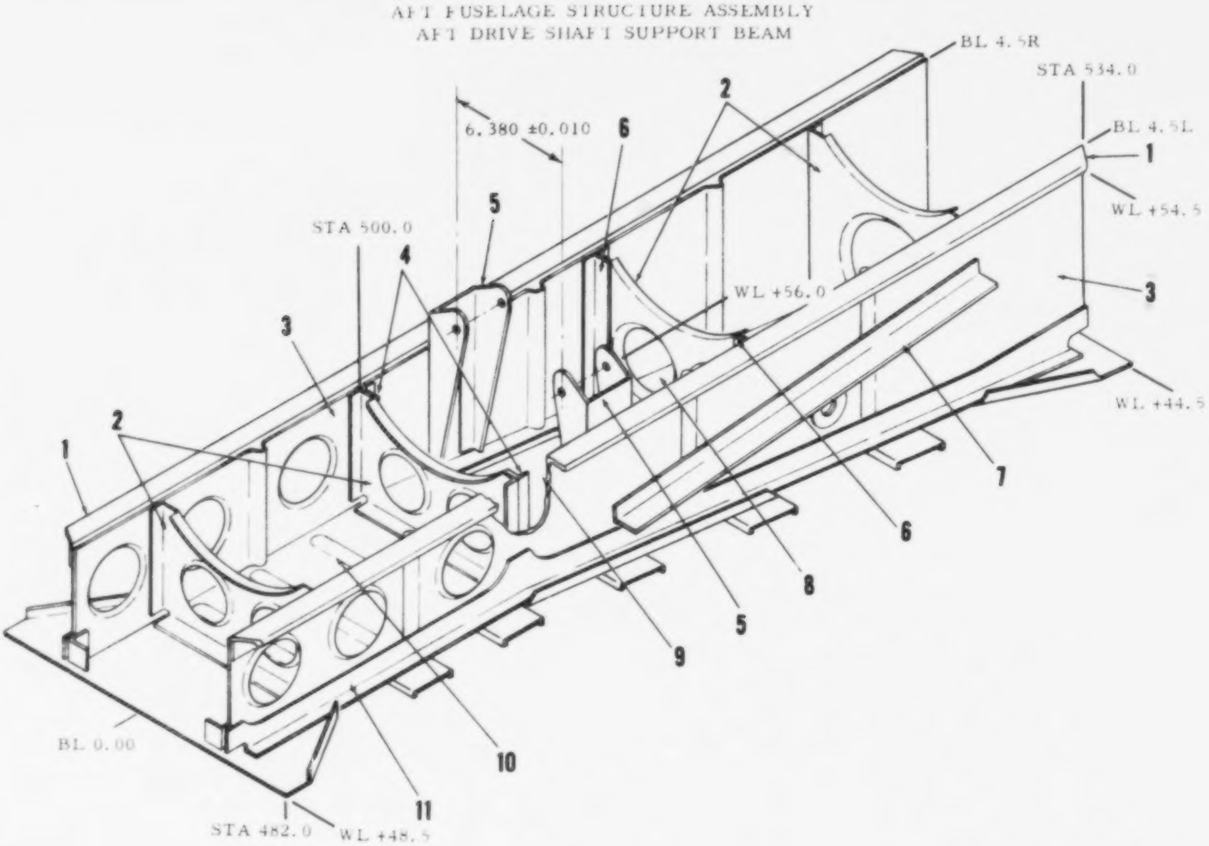
A. ALL DIMENSIONS ARE IN INCHES

B. REPAIR USING MATERIAL SAME AS ORIGINAL

42x41

B114-208-34SV

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 2 of 6)


AFT FUSELAGE STRUCTURE ASSEMBLY
AFT DRIVE SHAFT SUPPORT BEAM
BL 4.5R
STA 534.0
BL 4.5L
1
WL +54.5
2
6.380 ±0.010
6
5
STA 500.0
4
3
WL +56.0
3
WL +44.5
1
2
7
6
8
5
9
BL 0.00
10
11
STA 482.0
WL +48.5

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	AND10135-1004 7075-T6	0.090 4130	--
2	GUSSET	0.025 2024-T4 CLAD	0.032 2024-T4 CLAD	--
3	WEB	0.025 2024-T4 CLAD	0.032 2024-T4 CLAD	2-7
4	ANGLE	ALCOA 13637 7075-T6	NOTE B.	--
5	BRACKET	0.090 2024-T4 CLAD	NOTE C.	--
6	ANGLE	ALCOA 13637 7075-T6	0.063 4130	--
7	ANGLE	ALCOA 52735 7075-T6	0.063 4130	--
8	WEB	0.025 2024-T4 CLAD	0.032 2024-T4 CLAD	2-7
9	DOOR	0.040 AZ31B-H24 MAG	NOTE D.	--
10	WEB	0.025 2024-T4 CLAD	0.032 2024-T4 CLAD	2-7
11	CAP	AND10134-1401 7075-T6	0.100 4130	--

NOTES

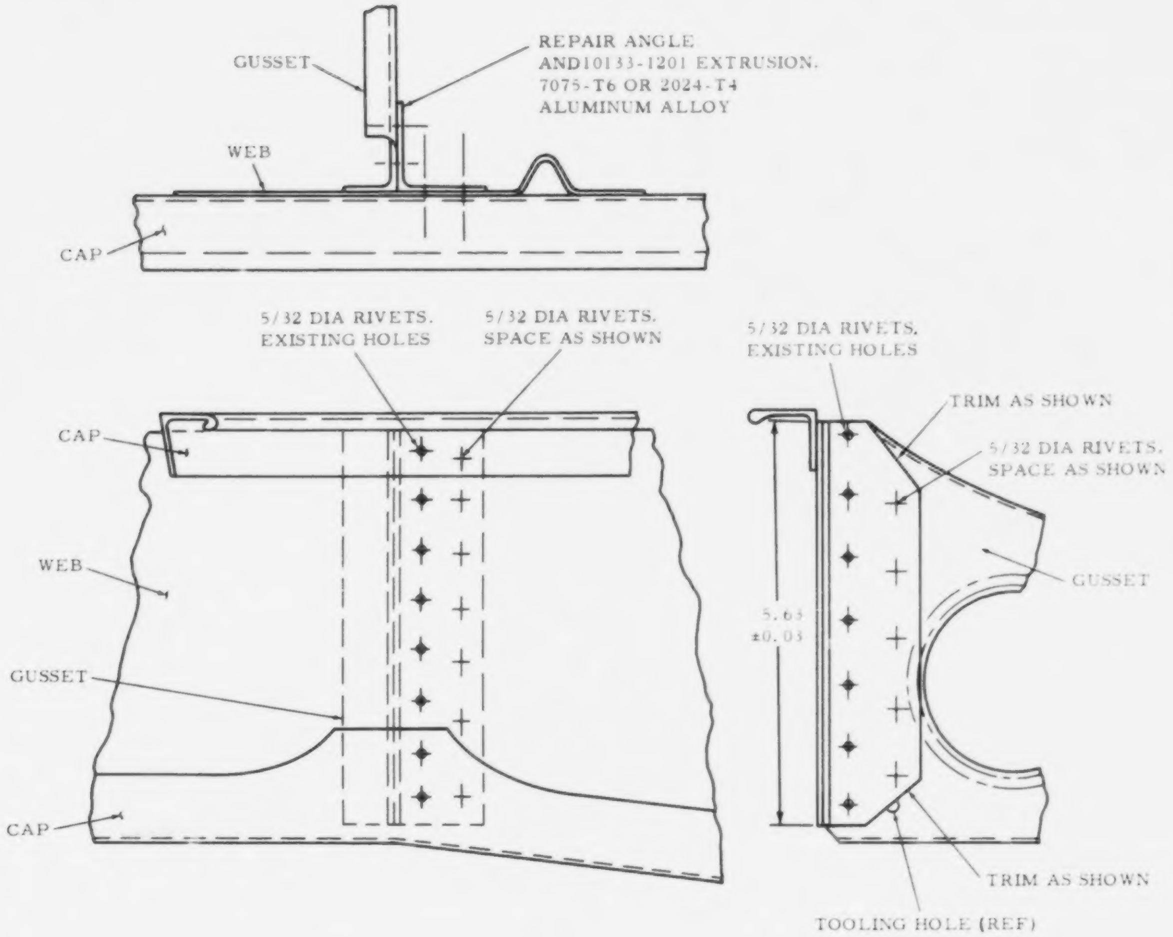
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW ANGLE FABRICATED FROM AND10133-1201 EXTRUSION. SEE SHEET 4 THIS FIGURE
C. REPLACE WITH NEW BRACKET 114S3365-37 LH OR -38 RH
D. REPLACE WITH NEW DOOR 114S3365-35

42x51

B114-321-34SV

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 3 of 6)

AFT FUSELAGE STRUCTURE ASSEMBLY
REPAIR ANGLE--AFT DRIVE SHAFT SUPPORT BEAM


GUSSET
REPAIR ANGLE AND10133-1201 EXTRUSION, 7075-T6 OR 2024-T4 ALUMINUM ALLOY
WEB
CAP
5/32 DIA RIVETS, EXISTING HOLES
5/32 DIA RIVETS, SPACE AS SHOWN
CAP
WEB
GUSSET
CAP
5/32 DIA RIVETS, EXISTING HOLES
TRIM AS SHOWN
5/32 DIA RIVETS, SPACE AS SHOWN
GUSSET
5.63 ±0.03
TRIM AS SHOWN
TOOLING HOLE (REF)

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. LH REPAIR ANGLE SHOWN, RH OPPOSITE
C. REMOVE ALL BURRS AND SHARP EDGES

42x46

B114-482-345V

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 4 of 6)

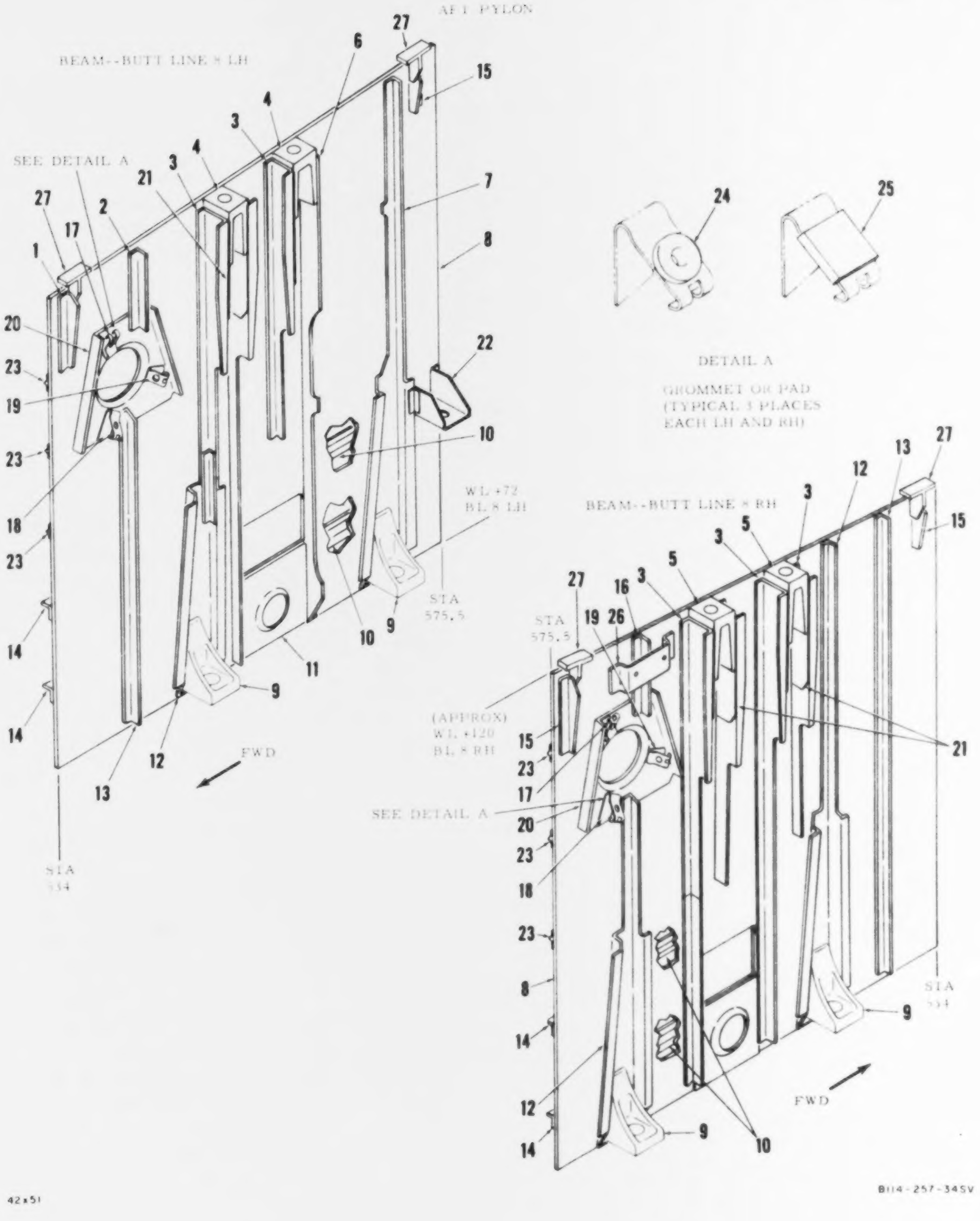

AFT PYLON
BEAM--BUTT LINE 8 LH
SEE DETAIL A
27
6
15
4
3
4
3
21
7
27
2
17
1
8
20
22
23
19
10
23
WL +72
BL 8 LH
18
23
STA
575.5
10
9
14
11
9
14
12
FWD
13
STA
534
24
25
DETAIL A
GROMMET OR PAD
(TYPICAL 3 PLACES
EACH LH AND RH)
27
13
12
BEAM--BUTT LINE 8 RH
3
5
15
3
27
5
16
3
STA
575.5
19
26
(APPROX)
WL +120
BL 8 RH
15
21
23
17
SEE DETAIL A
20
23
18
23
8
STA
534
9
14
FWD
12
9
10
14
42x51
B114-257-345V

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 5 of 6)

AFT PYLON
BEAMS--BUTT LINE 8 LH AND RH

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
2	ANGLE	0.050 2024-T4 CLAD	0.050 4130	--
3	CHANNEL	0.063 301 CRES 1/2H	0.050 7075-T6 CLAD	--
4	SUPPORT	2014-T6 FORGING	NOTE B.	--
5	SUPPORT	2014-T6 FORGING	NOTE D.	--
6	ANGLE	0.063 301 CRES 1/2H	0.071 4130	--
7	HAT	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
8	WEB	0.063 2024-T3 CLAD	0.063 2024-T3 CLAD	2-7
9	ATTACHMENT	2014-T6 FORGING	NOTE C.	--
10	STIFFENER	0.025 301 CRES 1/2H	0.032 301 CRES 1/2H	--
11	WEB	0.063 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
12	HAT	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	--
13	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	--
14	ANGLE	ALCOA 67580 7075-T6	0.063 4130	--
15	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
16	ANGLE	0.050 2024-T4 BARE	0.050 2024-T3 CLAD	--
17	BRACKET	114SK180-4	NOTE F.	--
18	BRACKET	114SK180-3	NOTE F.	--
19	BRACKET	114SK180-2	NOTE F.	--
20	DOUBLER	0.050 7075-T6 BARE	0.050 7075-T6 CLAD	--
21	STRAP	0.032 301 CRES 1/2H	0.040 301 CRES 1/2H	--
22	BRACKET	0.050 2024-T4 CLAD	0.050 2024-T3 CLAD	--
23	STIFFENER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
24 △	GROMMET	AN931-8-13	NOTE E.	--
25 □	PAD	AN8031-10-013	NOTE E.	--
26 ▽	SUPPORT	0.050 2024-T3 CLAD	0.050 2024-T3	--
27	TEE	ALCOA 37289 7075-T6	0.071 4130	--

△ USED ON HELICOPTERS 66-19098 THROUGH 67-18529
□ USED ON HELICOPTERS 67-18530 AND SUBSEQUENT
▽ USED ON HELICOPTERS 69-17125 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW SUPPORT 114S4832-3 FWD AND -4 AFT
C. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW ATTACHMENT 114S4805-4. USE LOCATING FIXTURE 114G1247-1, REPLACE ATTACHMENTS ONE AT A TIME TO PREVENT MISLOCATION
D. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW SUPPORT 114S4832-3
E. REPLACE GROMMET OR PAD WITH NEW PAD AN8031-10-013. BOND PAD TO BRACKET, REFER TO PARA 2-540
F. FOR DAMAGE OTHER THAN NEGLIGIBLE, REPLACE WITH NEW BRACKET 114S4118-220, CUT AND DRILL BRACKET AS REQUIRED FOR INSTALLATION

42x42

B114-258-345V

Figure 2-16. Beam Repairs—Aft Fuselage and Pylon Structure Assembly (Sheet 6 of 6)

SECTION I FUSELAGE

2-54. Cockpit Fuselage Structure Assembly.

This assembly (sta 21.5 to 160) includes the enclosure, equipment support structures, drip pan assemblies, and the cockpit heating and ventilation system ducts.

2-55. Inspection.

For damage parameters, refer to para 2-5.

2-56. Repair—Right Lower Longeron (AVIM). Repair cracks in the lower longeron on the right side at sta 120 and wl -29.28 as follows (see FO-4):

a. Remove lower cabin door 114S1620-57, including two hinge and stop fittings 114S1865-1 and -3, that are attached to floor. Refer to para 2-116 and see fig. 2-32.

b. Remove forward right floor panel assembly 114S2554-7, -27, or -32. Refer to para 2-336 and see fig. 2-87.

c. Remove two forward lower door coamings including brackets (aluminum coaming 114S1623-13 and fiberglass coaming 114S1623-19). Refer to para 2-138 and see fig. 2-38.

d. Remove door sill assembly 114S1622-3 at bottom of door opening.

e. Remove two bolts NAS624-15, washers MS20002C4 and MS20002-4, and nuts EB048, used to join upper and lower tension fittings at sta 120, wl -30, and bl 48r.

f. Remove tiedown ring and adapter assembly 114S2604-2 and tiedown receptacle 114S2711-1 at sta 124 and bl 44r. Refer to para 2-338 and see fig. 2-87.

g. If required, due to tool limitation, additional access to work area may be obtained by unfastening and peeling back skin at skin laps along sta 120 and wl -30.

h. Inspect all adjacent areas to the cracked longeron for damage.

i. Repair horizontal flange of longeron as follows:

(1) Unfasten and raise floor doubler 114S1553-37 or -43 from tiedown beam. Begin at sta 120 and work aft until doubler can be raised enough to provide access to floor plate 114S1553-27.

(2) Remove floor plate from horizontal flange of longeron. Remove rivets beginning at sta 120 and working aft. Remove a minimum of 16 rivets.

CAUTION

Do not damage supporting structure beneath floor plate.

(3) Cut floor plate at approximately sta 126.4 between outboard edge and bl 46.25r. (See FO-4.)

(4) Remove cut portion of floor plate from sta 119 aft to the cut.

(5) Make a repair angle from sheet steel (C325) ½ hard or sheet steel (C326). (See FO-4.) The finished angle size may vary according to location. Use a stock size of 18.4-inches long and 4.7-inches wide. Repair angle should be made to maintain configuration of removed portion of floor plate except as illustrated.

(6) Fit repair angle to longeron and locate existing 16 holes aft of crack and the eight rivet holes forward. Locate the 4 holes for installation of rivets BACR15DN5AD forward of sta 120 and the three holes for the USAF 461-4 rivets where repair angle overlaps floor plate. Locate two bolt holes for installation of tension fitting hardware.

(7) Drill and deburr holes as required.

(8) Apply dissimilar metal protection to the repair angle. Refer to para 2-619.

(9) Provide for fuselage sealing. Refer to para 2-554.

(10) Position the repair angle on the longeron and install the rivets. See FO-4.

NOTE

Install the rivets wet with zinc chromate primer (C259).

(11) Install two bolts NAS624-15, washers MS20002C4 and MS20002-4, and nuts EB048 in upper and lower tension fittings. **TORQUE BOLTS TO 90 TO 110 POUND-INCHES.**

(12) Position floor doubler 114S1553-37 or -43 and tiedown receptacle 114S2711-1. Provide for fuselage sealing. Refer to para 2-554. Use the removed Mylar tape if practical.

(13) Install rivets MS20470B6 and USAFD461-5 and -6 in floor doubler and receptacle.

j. Repair vertical flange of longeron as follows:

(1) Temporarily install outside skin in its original position.

(2) Temporarily install aluminum door coaming 114S1623-13.

(3) Make a repair strap from sheet steel (C325), ½ hard or sheet steel (C326). See FO-4.

NOTE

The finished dimensions of strap may vary due to exact location of cracks.

(4) Drill a minimum of 27 holes in strap for installation of 11 rivets BACR15DN5AD aft of crack 12 rivets BACR15DN5AD forward of crack, and 4 rivets USAF461-5 at sta 120. Pick up rivet hole pattern from existing holes in skin.

(5) Fit strap to skin. Fill gaps under strap at skin laps using 0.020-inch thick shim stock.

(6) Provide dissimilar metal protection for strap and shim. Refer or para 2-619.

(7) Provide for fuselage sealing. Refer to para 2-554.

(8) Install strap, shims, and rivets.

NOTE

Install rivets wet with zinc chromate primer (C259).

k. Install rivets as required, in skin laps and door coaming. Maintain original rivet pattern.

NOTE

Make sure fuselage sealing is maintained. (Refer to para 2-554.)

l. Install door sill assembly 114S1622-3, and two forward lower door coamings (aluminum 114S1623-13 and fiberglass 114S1623-19). Six additional holes will be required in repair angle to install door coaming brackets in their original positions. Refer to para 2-554 for fuselage sealing.

m. Install tiedown ring and adapter assembly 114S2604-2.

NOTE

Install attaching screws wet with zinc chromate primer (C259).

n. Install forward right floor panel assembly 114S2554-7, -27, or -32. See fig. 2-87.

o. Install lower cabin door 114S1620-57 and two hinge and stop fittings 114S1865-1 and -3.

p. Refinish repaired areas. Refer to para 2-617.

2-57. *Cockpit Enclosure.*

(See fig. 2-17.) The enclosure consists of three sections of framing, three windshield assemblies, four panel assemblies, and a door assembly. The upper framing consists of three skins, riveted together, and is supported by a deck at wl +48.31 and formed channels attached vertically. The deck at wl +48.31 is a beaded web attached to the bulkhead at sta 95 (canted) and to a stiffener which maintains the contour of the upper framing in the forward area. The forward and side framing contains forward, center, and aft support posts and upper and inter-sill assemblies. The forward posts are made of rectangular aluminum alloy tubing. The center posts are made of formed channels, riveted together, flange-to-flange, to form a box section. The aft posts are a single formed channel. The upper sill is a formed angle and has an extruded cap attached along the inboard edge. The inter-sill consists of a frame and a shield riveted together. The lower framing consists of a former assembly, a bulkhead, and a box assembly. The former assembly consists of two formed channels, one located on each side of the fuselage center line. The bulkhead consists of a web bounded by extruded caps and is installed within the former assembly. The box assembly is similarly located within the former assembly and consists of a bottom and two side webs. Extruded caps join the webs. All helicopters are equipped with windshields that consist of three layers. The center layer of the windshields is plastic. Inboard and outboard layers can be plastic, plastic and glass or glass and glass. The windshield can be heated electrically by embedded elements. All windshield assemblies are physically and electrically interchangeable. A typical window pane assembly, located in the crown and lower framework, consists of a section made of heat-resistant, acrylic plastic reinforced along the edges with 2-ply, laminated, acrylic-resin impregnated glass cloth. Window panes in the lower enclosure contain cutouts for SAS yaw ports. The door assembly, hinged on its upper edge, consists of an inner skin dished around cutouts and spotwelded to an outer skin. A strut made of aluminum alloy tubing is hinged to the inside of the door.

2-58. *Inspection—Cockpit Enclosure.*

Following inspection, damage to the cockpit enclosure components should be classified as negligible, reparable, or necessitating replacement.

2-59. Negligible Damage to Laminated Plastic Windshield. Damage which can be corrected by a simple procedure, such as stopdrilling of cracks and removal of small dents and damaged areas is permissible for formed metal parts. See fig. 2-3 for examples of damage to formed metal parts. Clean and refinish windshields as directed in para 2-67. The application of rain repellent (C271) following surface finishing or cleaning is not required.

2-60. Negligible Damage to Laminated Glass-Plastic Windshield. Damage which can be corrected by a simple procedure, such as stopdrilling of cracks and removal of small dents and damaged areas is permissible for formed metal parts. See fig. 2-3 for examples of damage to formed metal parts. Clean windshields as directed in para 2-67. Damage to windshield assemblies exceeding the criteria given in para 2-66 necessitates replacement.

2-61. Reparable Damage—Cockpit Enclosure. Damage more extensive than negligible, to the formed metal parts of the enclosure, can be repaired by patching. Complete or composite damage to the formed or extruded metal parts should be repaired by insertion. For typical repairs to the formed metal parts and to extruded metal parts refer to TM55-1500-204-25/1. See fig. 2-18 for information on spotwelding repairs to aluminum tubing. Refer to para 2-607 and TM 55-1500-204-25/1 for information on repair of transparent acrylic plastic parts. If removal of a windshield or window pane is necessary to accomplish repair, see fig. 2-18 for information on watertight sealing. If the pilots' assist straps are torn in the area of attaching hardware, they can be reinstalled using a machine screw AN525 and a washer AN960.

2-62. Damage Necessitating Replacement—Cockpit Enclosure. Extensive damage, such as the loss of a major portion of a section of enclosure or numerous isolated damages, necessitates replacement. Damage to windshield assemblies, exceeding criteria given in para 2-66, necessitates replacement. Seal windshield as shown in fig. 2-18.

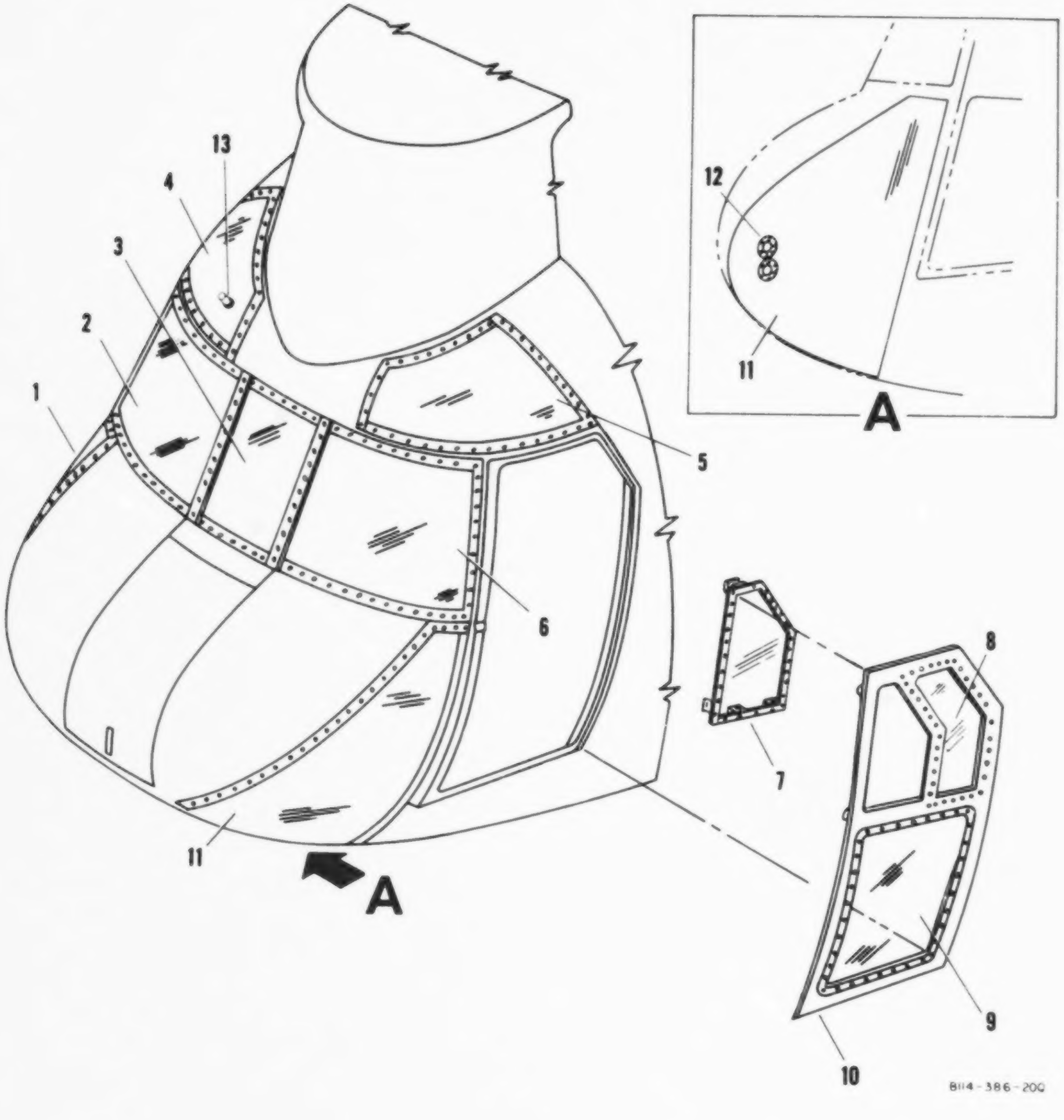
2-63. *Repair—Cockpit Enclosure Center Support Posts (AVIM).*

Subsequent steps provide information for repair of cracked center support posts. If only one post is damaged, the repair should be accomplished on both posts. This repair is intended for use with parts kits 114SK978-50, for aircraft, 66-19098 through 67-18493. See FO-5.

a. Clear access to support posts.

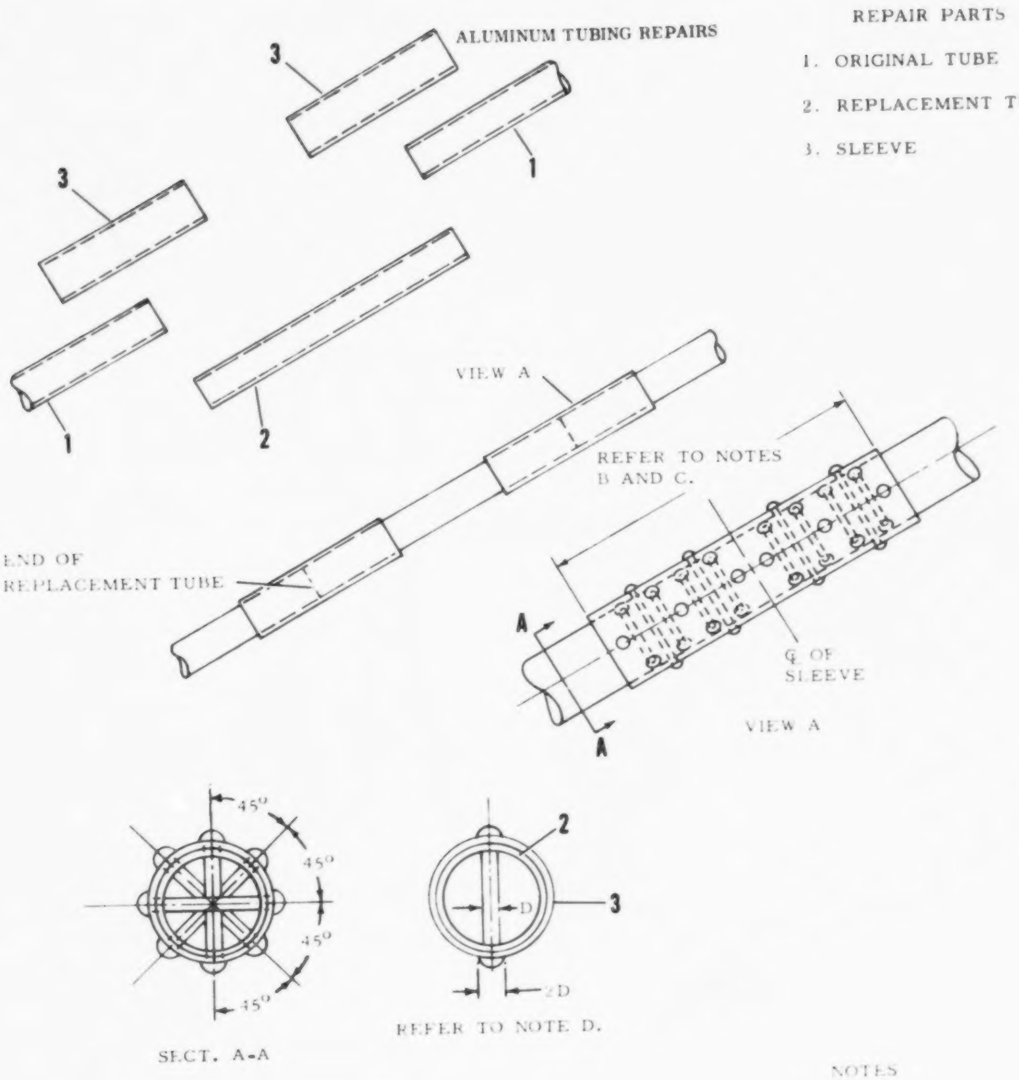
b. Remove retaining hardware as necessary to accomplish repair.

c. Remove and scrap plates 114S1603-177.


13
4
3
2
1
5
6
7
8
9
10
11
12
11
A
A
42 x 41
B114-386-200

1. RH nose bubble window
2. Pilot's windshield
3. Center windshield
4. RH crown window
5. LH crown window
6. Copilot's windshield
7. Jettisonable door sliding window
8. Jettisonable door upper fixed window
9. Jettisonable door fixed window
10. Jettisonable door assembly
11. LH nose bubble window
12. SAS port
13. Free air thermometer

Figure 2-17. Cockpit Enclosure


ALUMINUM TUBING REPAIRS
REPAIR PARTS
1. ORIGINAL TUBE
2. REPLACEMENT TUBE
3. SLEEVE
3
3
1
1
2
VIEW A
REFER TO NOTES B AND C.
END OF REPLACEMENT TUBE
A
A
℄ OF SLEEVE
VIEW A
45°
45°
45°
45°
SECT. A-A
2
3
D
2D
REFER TO NOTE D.

TUBES (1) AND (2)		SLEEVE (3)			RIVETS REQD
DIA	WALL	DIA	WALL	LENGTH	
0.50	0.035	0.625	0.058	9.375	MS20470AD5
0.75	0.065	0.875	0.058	9.375	MS20470AD5
0.875	0.065	1.0	0.058	9.375	MS20470AD5
1.0	0.065	1.125	0.058	11.25	MS20470AD6
1.25	0.065	1.25	0.058	11.25	MS20470AD6
1.25	0.058	1.375	0.058	11.25	MS20470AD6
1.375	0.058	1.5	0.958	11.25	MS20470AD6
1.5	0.058	1.625	0.058	15.0	MS20470AD8
1.625	0.058	1.75	0.058	15.0	MS20470AD8
1.75	0.058	1.875	0.058	15.0	MS20470AD8
1.875	0.058	2.0	0.058	15.0	MS20470AD8

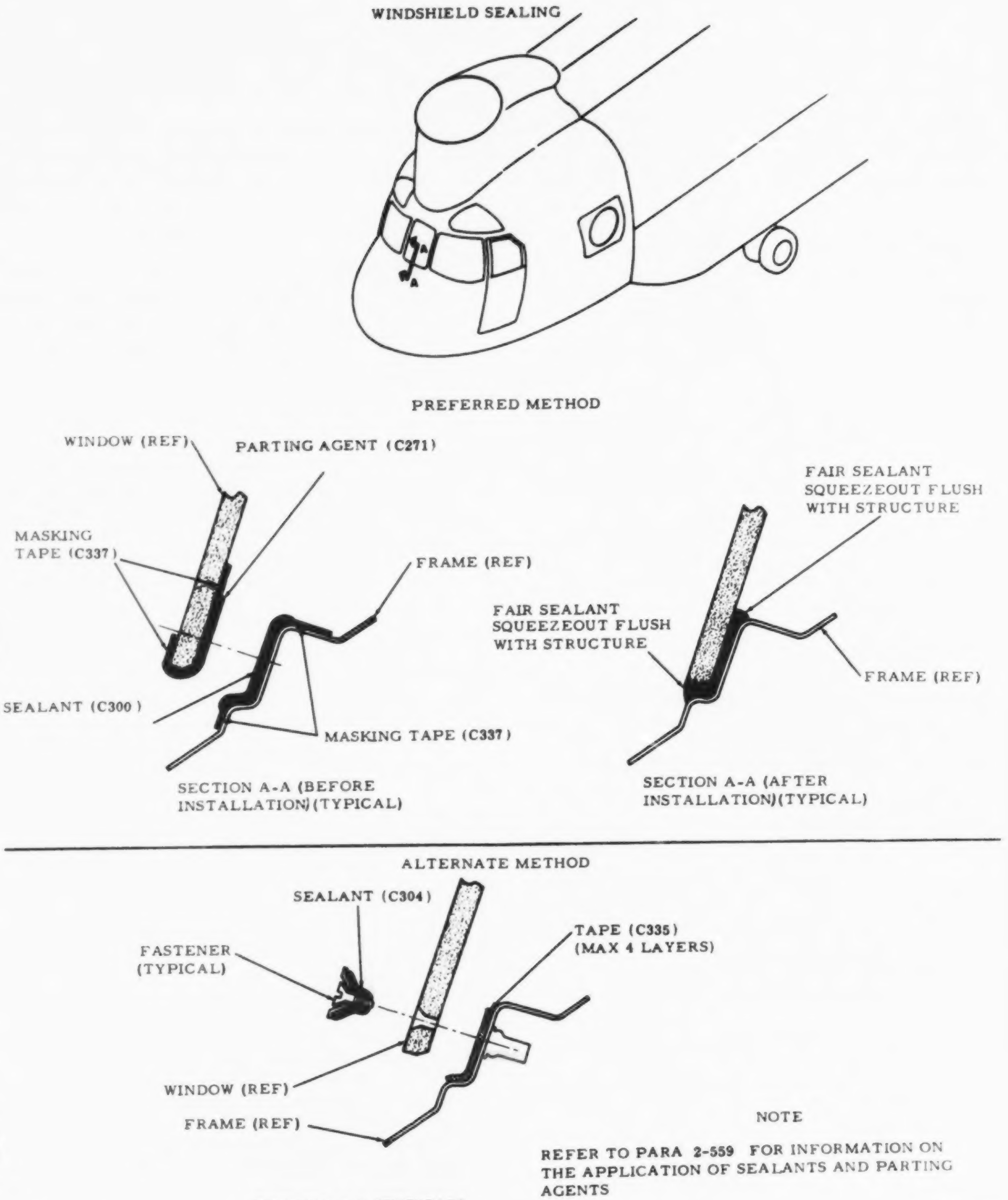
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. ALL RIVETS 3D PITCH
C. TOTAL NUMBER OF RIVETS REQUIRED: 18. 9 EACH SIDE OF SLEEVE CENTERLINE
D. FORM SHOP HEADS BY HAMMERING LIGHTLY. SHOP HEADS TO BE APPROXIMATE HEIGHT OF MANUFACTURED HEAD
E. USE SAME TYPE MATERIAL AS ORIGINAL FOR REPLACEMENT TUBE AND SLEEVE
F. REPAIR IS APPLICABLE TO STRUCTURAL TUBING ONLY. REFER TO TM55-1500-204-25/1 FOR INFORMATION ON REPAIR OF FLUID TUBING

B114 70 34SM

42x51

Figure 2-18. Enclosure Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 3)


WINDSHIELD SEALING
A
A
PREFERRED METHOD
WINDOW (REF)
PARTING AGENT (C271)
MASKING TAPE (C337)
FRAME (REF)
SEALANT (C300)
MASKING TAPE (C337)
FAIR SEALANT SQUEEZEOUT FLUSH WITH STRUCTURE
FAIR SEALANT SQUEEZEOUT FLUSH WITH STRUCTURE
FRAME (REF)
ALTERNATE METHOD
SEALANT (C304)
FASTENER (TYPICAL)
TAPE (C335) (MAX 4 LAYERS)
WINDOW (REF)
FRAME (REF)

SECTION A-A (BEFORE INSTALLATION) (TYPICAL)

SECTION A-A (AFTER INSTALLATION) (TYPICAL)

SECTION A-A (TYPICAL)

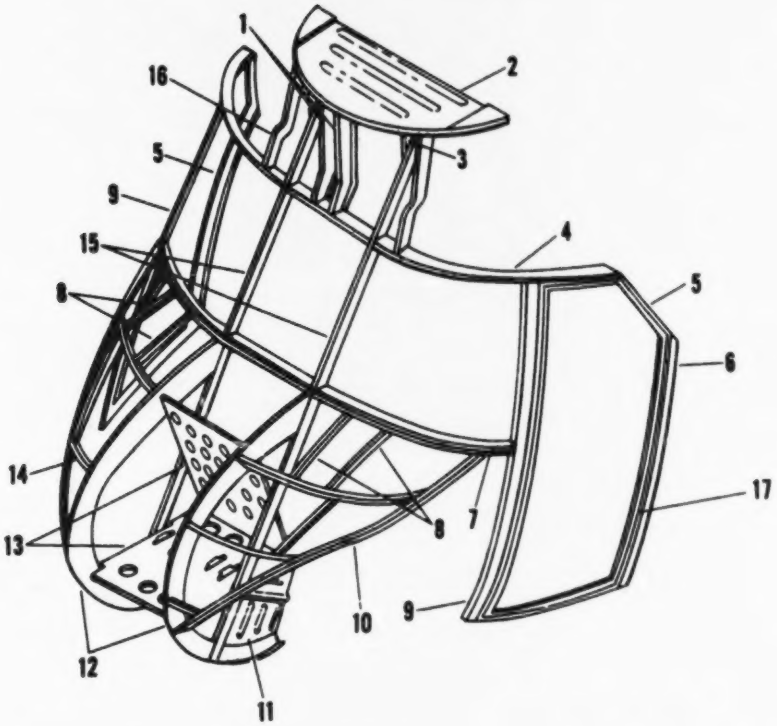
NOTE

REFER TO PARA 2-559 FOR INFORMATION ON THE APPLICATION OF SEALANTS AND PARTING AGENTS

8114-14-34SM

42x51

Figure 2-18. Enclosure Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 3)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-129.2
2	WEB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-129.2
3	GUSSET	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-129.2
4	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
5	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
6	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
7	FORMER	0.042 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
8	STIFFENER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-129.2
9	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
10	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
11	WEB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-129.2
12	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-129.2
13	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-129.2
14	STIFFENER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-129.2
15	POST	ALCOA T364 7075-T6	NOTE B.	--
16	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	2-129.2
17	SEAL	MOLDED SILICONE RUBBER	NOTE C.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO PARA 2-61 FOR REPAIR PROCEDURE
C. REPAIR WITH ORIGINAL MATERIAL SEE FIG 2-130
D. REPLACE WITH NEW SEAL 114SS664-3 LH OR
-4 RH, IF DAMAGE IS OTHER THAN NEGLIGIBLE

42x52

B114-153-34SN

Figure 2-18. Enclosure Repairs—Cockpit Fuselage Structure Assembly (Sheet 3 of 3)

d. Trim angles 114S1602-25 and -26, to clear post by 0.03 inch.

e. Remove brackets 114S1602-141 and -142. Trim off flange 1.68 from centerline of upper cutout. (See view C-C.)

f. Remove and scrap clips 114S1603-79 and -80.

g. Trim zees 114S1602-73 and -74, to clear windshield post by 0.03 inch.

h. Remove and scrap clips 114S1603-81 and -82.

i. Remove and scrap clips 114S1603-77.

j. Trim former 114S1604-147 left and -148 right, to clear post by 0.03 inch.

k. Locate reinforcement straps 114SK978-13, -14, -15, and -16, in position. The upper sections must align with edge of post and overlap gusset 114S1602-43, -44 opp. The lower section must overlap absorber mounting structure.

l. Drill existing wire and mounting holes.

m. Pick up existing rivet locations.

n. On upper end, install one shim 114SK978-17 on each side between strap and post. Rivet in place.

o. Install splice angles 114SK978-19, -21 left, and -20, -22 right.

p. Locate reinforcement plate 114SK978-25 left and -26 right, on inboard side of post. Rivet to post and zee.

q. Rivet clips 114SK978-35 left and -36 right, to zee and to post.

r. Mount and fasten the bracket (step e.) and angle 114SK978-23 left and -24 right, to strap and existing structure.

s. Locate clips 114SK978-29 and -30. Rivet in place.

t. Locate clips 114SK978-31 and -32. Rivet in place.

u. Locate clips 114SK978-33 and -34. Rivet in place.

v. Splice formers 114S1604-147 left and -148 right, to reinforced post with gusset 114SK978-38.

w. Butt the two tapered shims 114SK978-28, to absorber mounting structure. Rivet strap and tapered shims to post.

x. Through entire length of new straps, install rivets, 1 inch on center and a 2-diameter minimum edge distance.

2-64. Repair Pane Assembly.

Refer to TM 55-1500-204-25/1 for general information on repair of pane assemblies.

2-65. Windshield.

(See FO-6.) The windshield is made up of three sections: the pilot's windshield (2), center windshield (3), and the copilot's windshield (6). Each section consists of three layers. The center layer of all windshields is plastic. On pilot's and copilot's windshields 114SS601 series and center windshield 114SS602 series, inboard and outboard layers are also plastic. Pilot's and copilot's windshields 114SS604 series and center windshields 114SS605 series have a glass outboard layer and a plastic or glass inboard layer.

NOTE

> You can tell if the inboard layer is glass or plastic by the vendor number. The number is on the windshield above the terminal block. Windshields with glass have number VER-18-007-1, VER-18-008-1 or NP-1040-01-1. Windshields with plastic have number E-132500-1, E132500-2, or E-144600-1.

The pilot's and copilot's windshield can be heated electrically for anti-icing or defogging. The center windshield can be heated electrically for defogging only. A temperature sensing element is embedded in each section to provide automatic temperature control. Each section is installed against a rubber strip and is held in place by retainers, washers, and screws. A gasket is bonded to each retainer.

2-66. Inspection—Windshield. (See fig. 2-19.) The pilot's, copilot's and center windshields are divided optically into non-critical, critical, and wiper path area.

a. Inspect the windshield for nicks, dents, scratches, and discoloration. These defects are permissible in the non-critical border area and also in the critical and wiper path areas if they do not seriously impair pilot or copilot vision.

NOTE

> The heating element between the layers of the windshield is a metallic coating. This coating normally has a light gold tint which is not to be confused with discoloration.

b. Inspect the windshield for burn-out (discontinuity of electrical conductive coating). An indication of burn-out is usually a dark brown or gold discoloration. Sometimes the discoloration is accompanied by crazing or a crack in the windshield. This is caused by the heater element conductive coating burning out between the plastic layers of the windshield. Burn-out is permissible if the condition is not extensive.

c. Inspect the windshield for delamination (separation of plies). Delamination, noticeable as air blisters and bubbles, is permissible in all areas provided it does not interfere with vision. Delamination affecting the operation of the anti-icing or defogging system, but not interfering with vision, is allowable if the helicopter is operating where windshield heat is not needed. If windshield heat is needed but cannot be obtained because of delamination, replace the windshield.

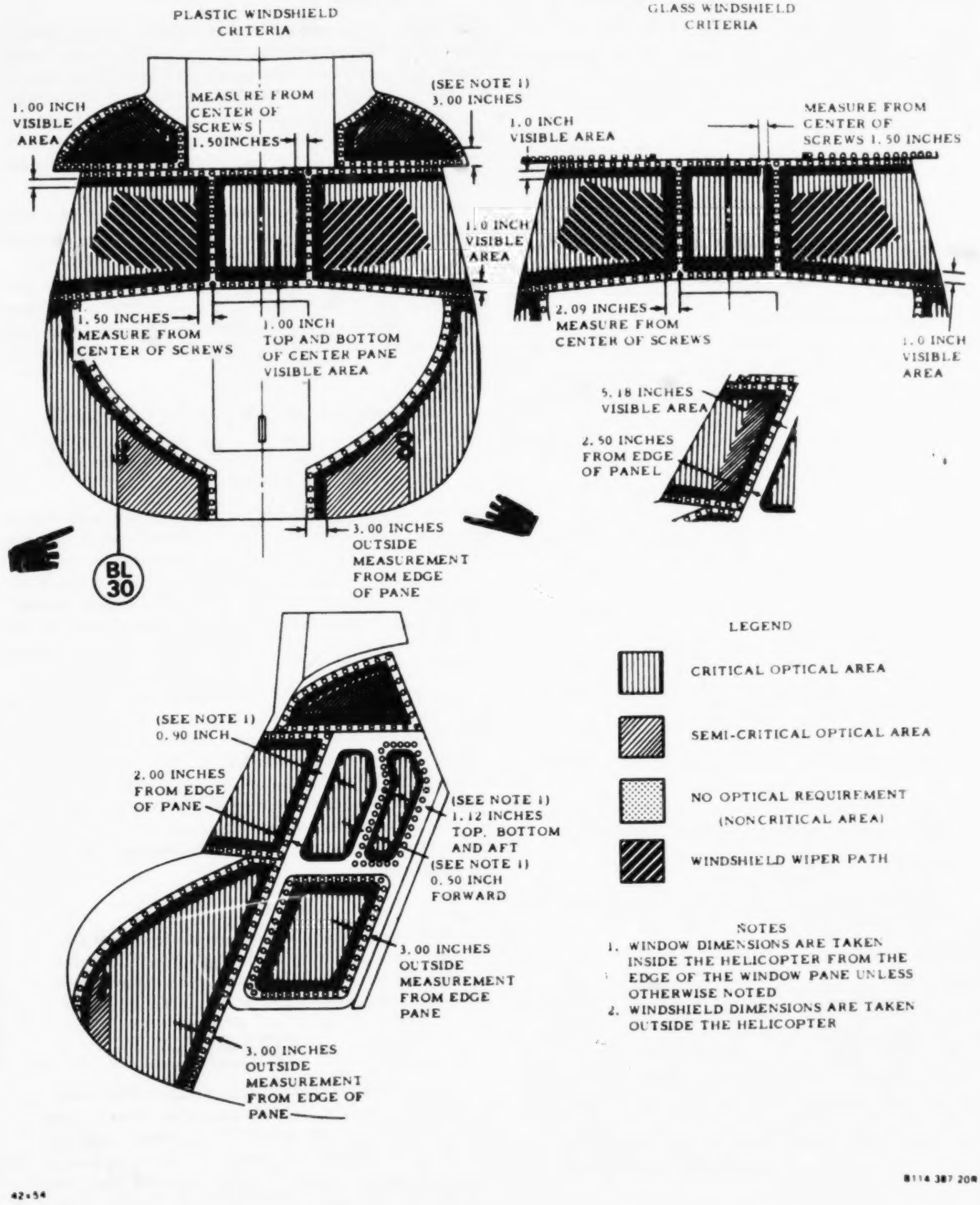
NOTE

> Make sure that delamination is the cause of inoperative anti-icing or defogging before replacing the windshield. A temperature controller or other component could be malfunctioning.

CAUTION

> Wiper XW21110-S-18 must be used with windshield 114SS601 series. Otherwise damage can result. Wiper XW21110-S-18 has three diagonal faintly colored yellow stripes ½ inch long and ½ inch apart. Wiper XW21110-H-18 has two stripes. Use wiper XW21110-H-18 with windshield 114SS604 series.

d. Inspect the windshield for scratches. If vision for the pilot or copilot is impaired, replace the windshield. Make sure the correct wiper is installed.


PLASTIC WINDSHIELD CRITERIA
GLASS WINDSHIELD CRITERIA
1.00 INCH VISIBLE AREA
MEASURE FROM CENTER OF SCREWS 1.50INCHES
(SEE NOTE 1) 3.00 INCHES
1.0 INCH VISIBLE AREA
MEASURE FROM CENTER OF SCREWS 1.50 INCHES
1.0 INCH VISIBLE AREA
1.50 INCHES MEASURE FROM CENTER OF SCREWS
1.00 INCH TOP AND BOTTOM OF CENTER PANE VISIBLE AREA
2.09 INCHES MEASURE FROM CENTER OF SCREWS
1.0 INCH VISIBLE AREA
5.18 INCHES VISIBLE AREA
2.50 INCHES FROM EDGE OF PANEL
3.00 INCHES OUTSIDE MEASUREMENT FROM EDGE OF PANE
BL 30
(SEE NOTE 1) 0.90 INCH
2.00 INCHES FROM EDGE OF PANE
(SEE NOTE 1) 1.12 INCHES TOP, BOTTOM AND AFT
(SEE NOTE 1) 0.50 INCH FORWARD
3.00 INCHES OUTSIDE MEASUREMENT FROM EDGE PANE
3.00 INCHES OUTSIDE MEASUREMENT FROM EDGE OF PANE
42x54
8114 387 208

LEGEND

▥ CRITICAL OPTICAL AREA

▨ SEMI-CRITICAL OPTICAL AREA

░ NO OPTICAL REQUIREMENT (NONCRITICAL AREA)

▨ WINDSHIELD WIPER PATH

NOTES

1. WINDOW DIMENSIONS ARE TAKEN INSIDE THE HELICOPTER FROM THE EDGE OF THE WINDOW PANE UNLESS OTHERWISE NOTED
2. WINDSHIELD DIMENSIONS ARE TAKEN OUTSIDE THE HELICOPTER

Figure 2-19. Cockpit Enclosure Optical Requirements

e. Inspect the windshield for cracks and severe crazing. Replace the windshield if either of these conditions exist.

NOTE

Closely examine a suspected crack to ascertain that it is not a delamination or a burnout condition.

2-67. Cleaning and Refinishing—Windshield Assembly and Pane Assembly Surface. Surface finish and clean laminated glass-plastic windshields and laminated plastic windshields and windows as directed in the following steps to comply with optical requirements.

a. If work is to be done in adjacent areas, install a protective cover such as barrier material, (C67), over the SAS **yaw ports. Secure barrier material with tape (C337). Do not apply masking tape directly over SAS yaw ports. Care and maintenance is most important. Clean and protect winshield surfaces as follows:**

b. Perform surface cleaning as follows:

(1) Flush area of part with running water to remove loose accumulations of foreign matter.

(2) Wash area of part with a soap (C311 or C312) and water solution. Use bare hand only to dislodge and remove remaining accumulations of foreign matter.

NOTE

A chamois (C94) can be used to carry the solution to surface of part but must not be used for removal of foreign matter.

WARNING

The vapors of naphtha are toxic. Cleaning procedures should be performed in a well-ventilated area. Avoid contact with the skin. If accidental contact with the skin is made, the exposed area should be flushed with water.

CAUTION

Do not use gasoline, alcohol, kerosene, benzene, xylene, ketones, carbon tetrachloride, fire extinguisher or deicing fluids, lacquer thinners, aromatic hydrocarbons, ethers, glass cleaning compounds or any other unapproved solvents on acrylic plastics.

(3) Remove oil or grease by wiping with cloth (C104) moist with naphtha (C218) or cleaner (C99). Wipe with a damp, soft, clean cloth (C108).

CAUTION

Avoid rubbing surface with dry cloths.

(4) On glass windshields apply glass cleaner (item 98, table 1-5) to the windshield. On plastic windshields, apply plastic polish (item 251, table 1-5). Use a piece of clean soft cotton flannel (item 104, table 1-5). Use another clean piece to polish entire area until it is clear and dry.

c. Surface finishing of laminated plastic windshields and windows is accomplished as follows:

CAUTION

Do not attempt to refinish the surface of glass windshields. Damage to windshields exceeding the criteria given in para 2-66 necessitates replacement.

(1) Mask adjacent areas to protect them from damage.

(2) While keeping the surface covered with water at all times, sand the surface to be finished using 280-grit or finer abrasive paper (C3 or C4) mounted on a rubber or wood block. A rubber block is preferred.

(3) Progressively change to a finer grit abrasive paper, and repeat step (2) until a smooth even finish is achieved. Flush surface with water to remove loose accumulations of foreign matter.

(4) Polish sanded surface, using a stitched buffing wheel mounted in a buffing machine and buffing compound (C72).

CAUTION

Machine polishing of critical optical areas by a qualified operator is mandatory. Semicritical and noncritical areas only can be polished by hand. Use rouge (C280) applied with a water-moistened pad of cloth (C108).

(5) Polish sanded surface, using an unstitched buffing wheel and buffing compound (C73).

(6) Using a cleaner-polish (C103) applied with a water-moistened pad of cloth (C108) polish surface to desired luster.

(7) If required, a high-luster finish can be obtained by using wax (C379) applied to surface with a water-moistened pad of cloth (C108) and rubbing lightly in a circular motion:

WARNING

Do not allow rain repellant to come in contact with open flame as deadly hydrogen fluoride gas could be generated. Wash hands with soap and water after handling rain repellent.

(8) Apply rain repellent (C271), if required, to windshields using a flannel cloth (C108).

2-68. Removal—Windshield (See FO-6.)

a. Make sure that all electrical power is off. Unplug the battery.

b. Disconnect the electrical wires from the terminals on the windshield. Tag the wires from the terminals on the windshield. Tag the wires before disconnecting them.

CAUTION

The wiper arm must be removed or held clear of the windshield to prevent damage to the windshield.

c. If removing either the pilot's or copilot's windshield panel, obtain a ⅛-inch-diameter rod, approximately 2-inches long. Hold the windshield wiper arm assembly clear of the windshield. Insert the rod through the cross hole in the arm channel adjacent to the hub.

d. When windshield 114SS604 series is replaced by windshield 114SS601 series, remove wiper. (Refer to para 12-52.)

e. Remove the pilot's or copilot's windshield panel (4 or 11), as follows:

(1) All glass installation:

NOTE

Windshield 114SS604 series is covered by a warranty for leakage, delamination, and conformance to specification. Do not scrap windshield until items in step f. have been checked.

(a) Remove screws (1 and 7), washers (2 and 8), and filler retainers (12 and 17).

(b) Remove windshield panel.

(2) All plastic installation:

(a) Remove screws (1 and 7) and washers (2 and 8).

(b) Remove top retainer (3), bottom retainer (19), corner retainers (20 and 22), T-retainers (5-16) or (10 and 14), outboard (21) and inboard retainers (18 or 13), and filler retainer (17 or 12).

(c) Remove windshield panel.

(3) Glass from intermixed glass and plastic installation:

(a) Remove screws (1 and 7), washers (2 and 8), filler retainer (17 or 12).

(b) Remove windshield panel.

(4) Plastic from intermixed glass and plastic installation:

(a) Remove screws (1 and 7) and washers (2 and 8).

(b) Remove top and bottom retainers (3 and 19), corner retainers (20 and 22), T-retainers (5 and 16) or (10 and 14), outboard (21) and inboard retainers (18 or 13), and filler retainer (17 or 12).

(c) Remove windshield panel.

f. Handle a removed 114SS604 windshield as follows:

(1) Check the date of manufacture of the windshield. Date should be on windshield.

(2) Check date of installation as noted in the aircraft log.

(3) Check the number of flight hours since installation as noted in the aircraft log.

(4) If the date of manufacture is less than 24 months prior to removal, the windshield may be eligible for a claim. Return the windshield to supply so that a warranty claim can be made.

(5) If the date of installation is less than 12 months prior to damage and if the flight hours are less than 300, the windshield may be eligible for a claim. Return the windshield to supply so that a warranty claim can be made.

g. Remove the center windshield panel (6) as follows:

(1) Remove screws (1 and 7) and washers (2 and 8).

(2) Remove the T-retainers (5, 10, 14, and 16) if installed.

(3) Remove the top retainer (9) and bottom retainer (15) if installed.

(4) Remove the inboard retainers (13 and 18) with gaskets (24), if installed, and filler retainers (12 and 17).

(5) Carefully remove the center windshield panel (6).

2-69. *Installation—Windshield.* (See FO-6.)

a. Before installing a pilot's, copilot's, or center windshield panel, test the windshield panel anti-ice or anti-fog, heating element and sensors.

b. Inspect the cellular rubber strip (23) for damage and for proper bonding. Replace a damaged strip as follows:

(1) Remove any damaged strip. Clean the area with methyl-ethyl-ketone (C216). Cut a replacement rubber strip from rubber (C283).

(2) Apply a coat of primer (C265) to the fuselage frame with a brush. Allow the primer to air dry a minimum of 30 minutes.

(3) Apply adhesive (C18) to the fuselage frame and the rubber strip with a brush. Install the strip immediately.

(4) Apply sufficient pressure to insure complete contact but not enough to squeeze out the adhesive. Allow the adhesive to cure under contact pressure for a minimum of 24 hours at 70° to 80°F.

(5) Butt splice the strip (23) as required to obtain a continuous seal. Bond the butt splice with adhesive (C18).

c. Install the pilot's or copilot's windshield panel (4 or 11) as follows:

(1) All glass installation:

NOTE

Only filler retainers (12 and 17) are used in this installation.

(a) Position the replacement windshield against the rubber strip (23) on the supporting framework. Position the heating and sensing element terminals as shown in fig. 2-20.

(b) (See FO-6.) Place filler retainer (17) for pilot's windshield, or (12) for copilot's windshield in the recessed area between the inboard windshield panel and the outboard windshield panel.

(c) Secure windshield panel with screws (1 and 7) and washers (2 and 8). TORQUE SCREWS AROUND THE WINDSHIELD PANEL 180° APART, TO 10 TO 14 POUND-INCHES.

(d) Remove rod from windshield wiper arm. Lower wiper into contact with windshield.

NOTE

Wiper XW21110-H-18 is preferred with glass windshield 114SS604 series. However, wiper XW21110-S-18 can also be used with the glass windshield.

(2) All plastic installation:

(a) Position the replacement windshield against the strip (23) on the supporting framework. Position the heating and sensing element terminals as shown in fig. 2-20.

(b) (See FO-6.) Place the filler retainer (17), for the pilot's windshield; or (12), for the copilot's windshield in the recessed area between the inboard windshield panel and the outboard windshield panel.

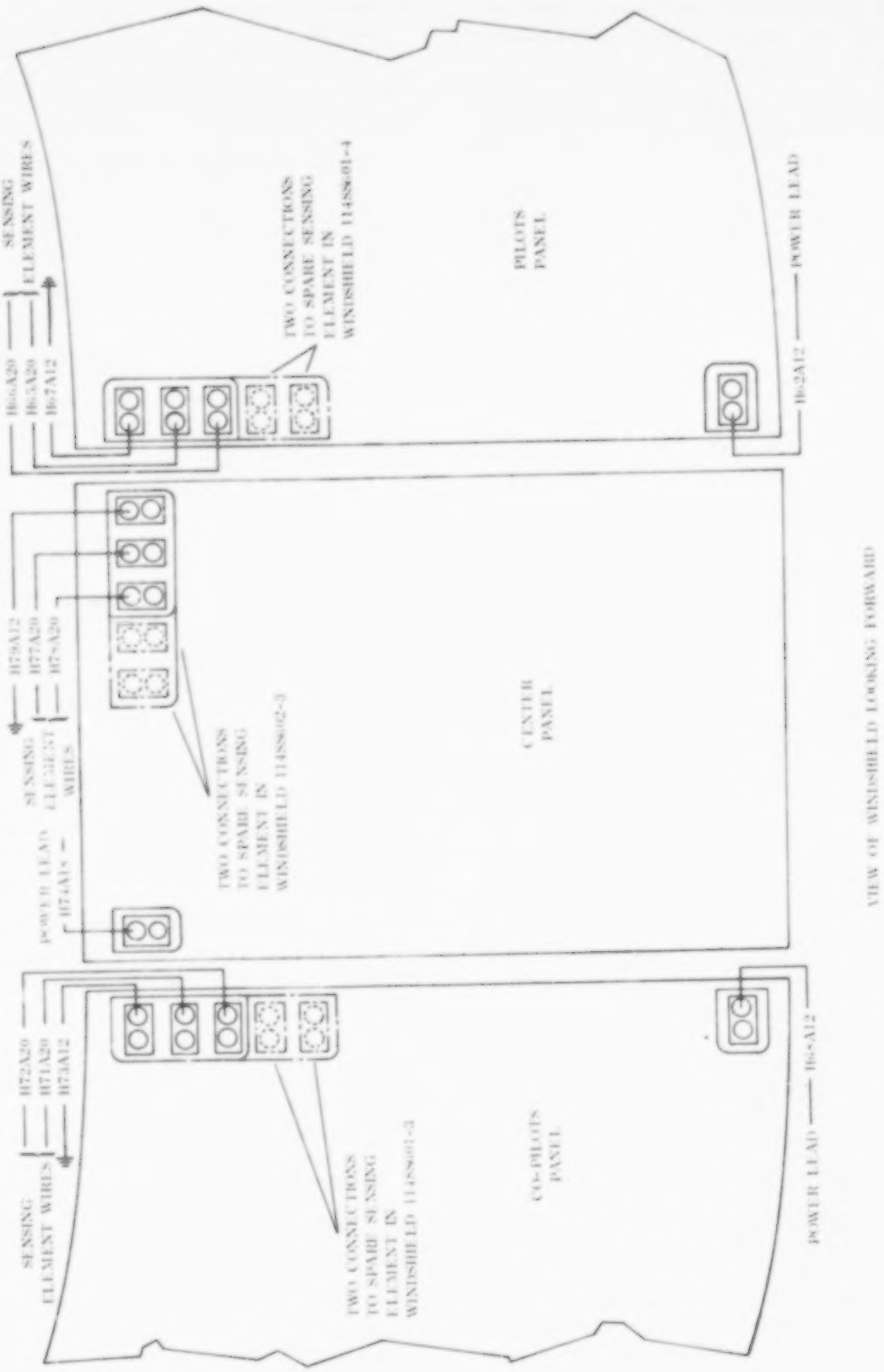

H66A20
H65A20
H67A12
SENSING ELEMENT WIRES
TWO CONNECTIONS TO SPARE SENSING ELEMENT IN WINDSHIELD 114S8001-4
PILOTS PANEL
H62A12
POWER LEAD
H79A12
H77A20
H78A20
SENSING ELEMENT WIRES
POWER LEAD H74A18
TWO CONNECTIONS TO SPARE SENSING ELEMENT IN WINDSHIELD 114S8002-3
CENTER PANEL
H72A20
H71A20
H73A12
SENSING ELEMENT WIRES
TWO CONNECTIONS TO SPARE SENSING ELEMENT IN WINDSHIELD 114S8001-3
CO-PILOTS PANEL
H68A12
POWER LEAD
VIEW OF WINDSHIELD LOOKING FORWARD

Figure 2-20. Windshield Electrical Connections

(c) For the pilot's windshield installation, install the top retainer (3), bottom retainer (19), corner retainers (22 and 20), T-retainers (5 and 16), outboard retainer (21) and inboard retainer (18).

(d) For the copilot's windshield installation, repeat step (c) except use T-retainers (10 and 14) and inboard retainer (13).

(e) **TORQUE THE SCREWS (1 AND 7) AROUND THE WINDSHIELD PANEL 180° TO 10 TO 14 POUND-INCHES.**

(f) Remove the rod from the windshield wiper arm. Lower the wiper into contact with the windshield.

CAUTION

Wiper WX21110-S-18 must be used with windshield 114SS601 series. Otherwise damage to windshield can result.

(g) Check that proper wiper is installed. Windshield 114SS601 series requires wiper XW21110-S-18.

(3) Glass 114SS604 series from intermixed glass and plastic installation: (Refer to c.(1)). Only filler retainer (12 or 17) is used in the glass portion of the glass and plastic windshield installation. Omit retainers as shown in FO-6.

(4) Plastic 114SS601 series from intermixed glass and plastic installation:

(a) Position the replacement windshield against the rubber strip (23) on the supporting framework. Position the heating and sensing element terminals as shown in fig. 2-20.

(b) (See FO-6.) Place the filler retainer (17), for the pilot's windshield; or (12) for the copilot's windshield in the recessed area between the inboard windshield panel and the outboard windshield panel.

(c) For the pilot's windshield installation, install the top retainer (3), bottom retainer (19), corner retainers (22 and 20), T-retainers (5 and 16), outboard retainer (21) and inboard retainer (18).

(d) For the copilot's windshield installation, repeat step (c) except use T-retainers (10 and 14) and inboard retainer (13).

(e) **TORQUE THE SCREWS (1 AND 7) AROUND THE WINDSHIELD PANEL 180° APART, TO 10 TO 14 POUND-INCHES.**

(f) Remove the rod from the windshield wiper arm. Lower the wiper into contact with the windshield.

CAUTION

Wiper XW21110-S-18 must be used with windshield 114SS601 series. Otherwise damage to windshield can result.

(g) Check that proper wiper is installed. Windshield 114SS601 series requires wiper XW21110-S-18.

d. Install the center windshield panel (6), either 114SS602 series or 114SS605 series, as follows:

(1) Between all glass windshield installation:

(a) Position the replacement windshield against the rubber strip (23) on the supporting framework. Position the heating and sensing element terminals as shown in fig. 2-20.

(b) Install the filler retainers (17 and 12).

NOTE

Only filler retainers (17 and 12) are used in this installation.

(c) Secure the windshield panel with screws (1 and 7) and washers (2 and 8). **TORQUE SCREWS AROUND THE WINDSHIELD PANEL 180° APART, TO 10 TO 14 POUND-INCHES.**

(2) Between all plastic windshield installation:

(a) Position the replacement windshield against the rubber strip (23) on the supporting framework. The heating and sensing element terminals shall be positioned as shown in fig. 2-20.

(b) (See FO-6). Install the top retainer (9), bottom retainer (15), filler retainers (17 and 12), inboard retainers (18 and 13), with gaskets (24), and T-retainers (5, 10, 14, and 16) loosely around the windshield. Use screws (1 and 7) and washers (2 and 8).

(c) **TORQUE THE SCREWS (1 AND 7) AROUND THE WINDSHIELD PANEL 180° APART, TO 10 TO 14 POUND-INCHES.**

(3) Between glass and plastic installation:

(a) Position the replacement windshield against the rubber strip (23) on the supporting framework. Position the bearing and sensing element terminals as shown in fig. 2-20.

NOTE

Retainers (9 and 15) are omitted entirely in this installation. T-retainers (5, 10, 14 and 16), and retainers (13 and 18) are omitted as applicable. (See FO-6.)

(b) (See FO-6.) Install filler retainers (17 and 12), inboard retainer (18 or 13 as applicable), and T-retainers (5 and 16, or 10 and 14 as applicable) loosely around the windshield with screws (1 and 7) and washers (2 and 8).

(c) **TORQUE SCREWS (1 AND 7) AROUND THE WINDSHIELD PANEL 180° APART, 10 TO 14 POUND-INCHES.**

e. Connect the electrical wires to the terminals. (See fig. 2-20.)

f. Connect ac electrical power to check windshield heating. (Refer to para 1-97.)

CAUTION

Make certain that the ANTI-FOG, or ANTI-ICE & ANTI-FOG switch is at OFF after the optional check. Leaving the switch on could result in overheating and cause discoloration of the windshield.

g. Set the ANTI-FOG or ANTI-ICE & ANTI-FOG switch to either position. When the windshield becomes warm, set the switch to OFF.

2-70. Cockpit Windows.

(See fig. 2-17.) There are 10 windows in the cockpit enclosure: two crown windows (4 and 5), two nose bubble windows (1 and 11), and three windows (7, 8, and 9) in each jettisonable door assembly.

a. All window panes are installed in their frames against sealant tape. The nose bubble and crown panes are secured by screws and washers. The jettisonable door panes are secured by screws, washers, and nuts.

b. A free air temperature thermometer (13) is installed in the right crown pane. Two SAS ports (12) are installed in each nose bubble pane.

2-71. Cleaning—Cockpit Windows. Refer to para 2-67(b).

2-72. Inspection—Cockpit Windows. (See fig. 2-19.) The nose bubble windows, and the jettisonable door fixed and sliding windows are divided into critical and noncritical optical areas. The crown window area is divided into semicritical and noncritical optical areas.

a. Inspect the nose bubble windows, and the jettisonable door fixed and sliding windows for the following:

(1) In the noncritical area, nicks, dents, scratches, blemishes, and discoloration are permissible. These defects are also permissible to a lesser extent in the semicritical and critical areas. If possible, polish out blemishes and other defects which cause distortion rather than replace the pane.

(2) Cracks up to 6 inches in length in non-critical areas can be repaired in accordance with TM 55-1500-204-25/1 provided the repair is contained within the non-critical area. If a pilot finds that a repair interferes with his vision while operating the helicopter, then the pane must be replaced. The area from the inboard edge of the chin pane to B.L. 30 is designated a semi-critical area. Cracks in this area, up to 3 inches long, may be stop drilled and the drilled hole plugged with sealant (C305.2).

NOTE

If the windows are tinted, discoloration will usually appear as a dark brown or gold color in a local area. If the windows are not tinted, discoloration will appear as a lighter shade of brown or gold in a local area.

b. Inspect the crown window area, applying the standards used in step a.

2-73. Refinishing—Cockpit Windows. Refer to para 2-67(c).

2-74. Removal—of Transparent Plastic Panes. (See fig. 2-17.)

a. Remove the pane from either crown window (4 or 5) as follows:

(1) If a right pane is to be removed, remove the free air temperature thermometer as follows:

(a) Unscrew the exterior sunshield from the thermometer stem. Remove the dished washer and outer case washer.

(b) Withdraw the thermometer (13) into the cockpit through the hole in the pane (4).

(2) Remove the screws and washers securing the pane to the cockpit structure.

(3) Remove the pane.

b. Remove the pane from either nose bubble window (1 or 11) as follows:

(1) (See fig. 2-21.) Unplug the electrical cables at the SAS adapter connectors. Disconnect the SAS tubing.

(2) Remove screws (1) securing the SAS ports to the pane (4). Remove retainers (2) and SAS adapters (3).

(3) Remove the screws and washers securing the pane to the cockpit structure. Remove pane (5).

NOTE

For removal of jettisonable door window panes, refer to para 2-85, 2-89 and 2-91.

2-75. Installation—Transparent Plastic Panes. (See fig. 2-17.)

a. Install the pane in either crown window (4 and 5) as follows:

(1) Position the pane on the sealant tape (C307) on the supporting framework.

(2) If the pane is a replacement part, proceed as follows:

(a) Mark the locations of the 39 securing screw holes around the pane edge. Mark the locations to match the hole pattern in the window frame. For a right pane, mark the location of the free air temperature thermometer mounting hole. The location is on bl 19.5, 4 inches from the forward window edge.

CAUTION

Take care to prevent cracking when drilling acrylic plastic. Make sure that the area to be drilled is well supported. Use a wooden backing block or suitable equivalent.

(b) Remove the pane. Drill the securing screw holes at the 39 marked locations. Use a 60° 13/32-inch diameter drill. For a right pane, drill the thermometer mounting hole at the marked location. Use a 60° 11/64-inch diameter drill.

(c) Reposition the pane on the window frame. Check that the screw holes in the pane and frame are correctly aligned.

(3) Install the screws and washers in the pane and frame. Apply a fillet seal between each screw and washer, and between each washer and the pane. Use sealant (C300 or C301). TORQUE THE SCREWS TO 10 TO 14 POUND-INCHES. Torque opposite screws alternately, working around the window.

(4) For a right pane, install the free air temperature thermometer as follows:

(a) Insert the thermometer through the hole in the pane from within the cockpit. Install the outer case washer and dished washer.

(b) Install the exterior sunshield on the thermometer stem.

(5) Apply a fillet seal around the pane edge, flush with the surrounding structure. Use sealant (C300 or C501).

b. Install the pane in either nose bubble window (1 or 11) as follows:

NOTE

When a chin bubble pane is being installed in a frame too large for the pane, the frame may be extended up to 3/4 inch and the rivnuts relocated (Figure 20.1). Use a .050 inch thick doubler of 2024-T3 or T4 aluminum on the inside of the frame. Attach the doubler to the frame wtih MS20426AD5 rivets with heads to the outside of the frame. Use a 2024-T3 or T4 filler of appropriate thickness to fill the space between the doubler and pane. Use MS20426AD4 rivets with heads to the outside to fasten the filler in place. Offset new rivnut holes with respect to existing holes so that there is at least .12 inches of material between holes.

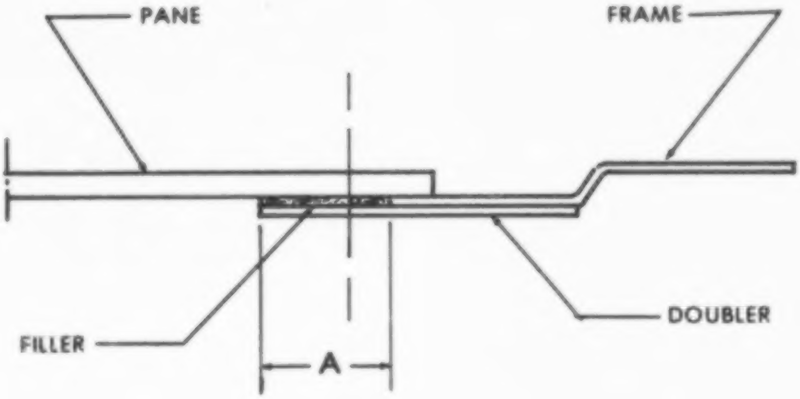
(1) If the pane is a replacement part, proceed as follows:

(a) Find the two SAS port locations on the pane

NOTE

The locations are identified by two 0.5-inch-diameter decals on the pane surface. The center points are marked.

(b) Cut a 2.54-inch-diameter hole in the pane at each location.



A EXTENSION OF FRAME TO FIT PANE (.75 MAX.)

Figure 2-20.1. Extension of Frame

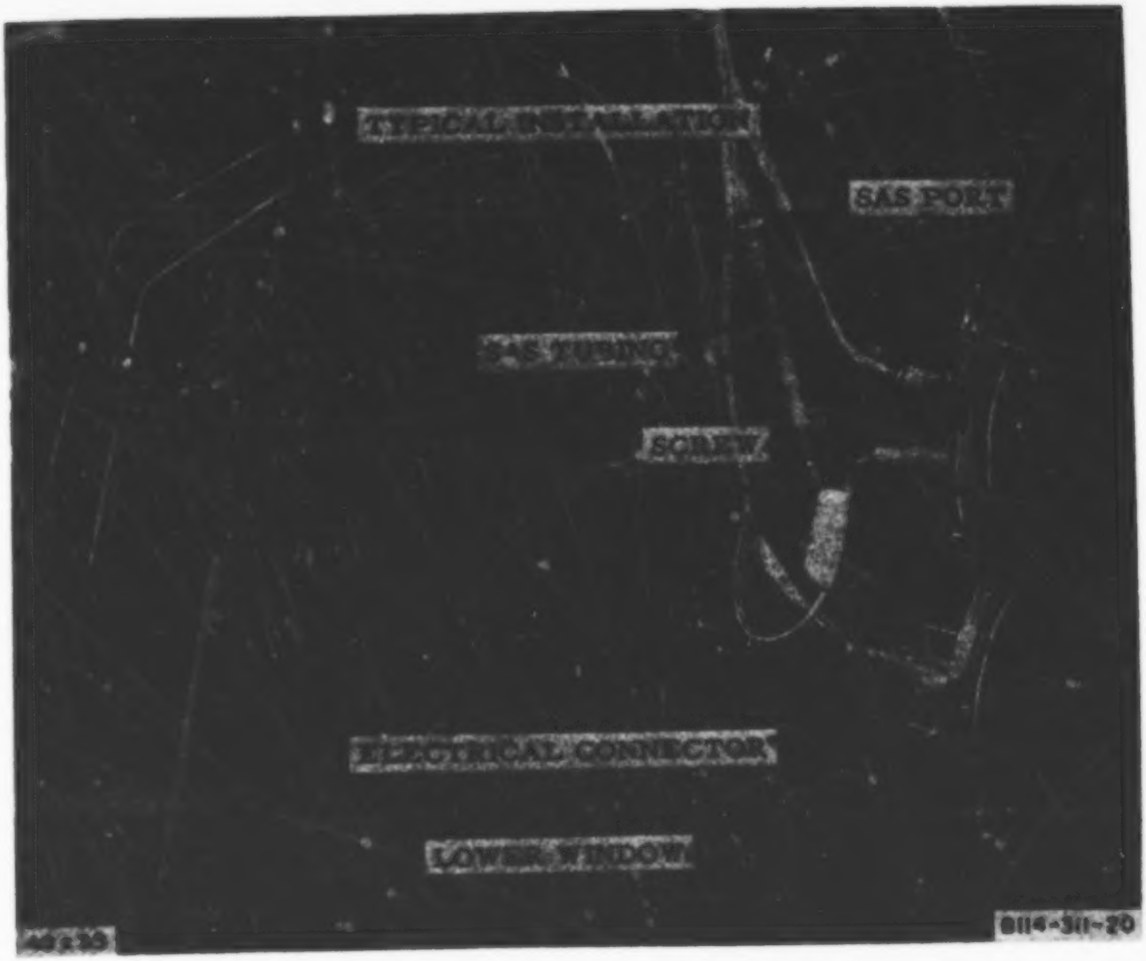


Figure 2-21. Installation of SAS Ports (Sheet 1 of 2)

(c) (See fig. 2-21.) Make two reinforcing strips (4) for each SAS mounting hole. Make each strip from two plies of glass cloth (C112) impregnated with cement (C89).

(d) Clean the contacting surfaces of the pane and strips. Use naphtha (C217). Cement a reinforcing strip around each SAS port mounting hole on the inner and outer pane surfaces. Use cement (C89).

(2) Position pane and sealant tape (C307) on the supporting framework.

(3) If the pane is a replacement part, proceed as follows:

(a) Mark the locations of the 76 securing screw holes around the pane edge. Mark the locations to match the hole pattern in the window frame.

(b) Temporarily install each SAS port adapter (3) in its mounting hole. Make sure the TOP mark is up. Make sure the upper and lower bolt holes in the adapter flanges are on the vertical center line. Mark the locations of the securing screw holes on the pane to match the holes in the SAS port adapter flanges. Remove the SAS port adapters and the pane.

CAUTION

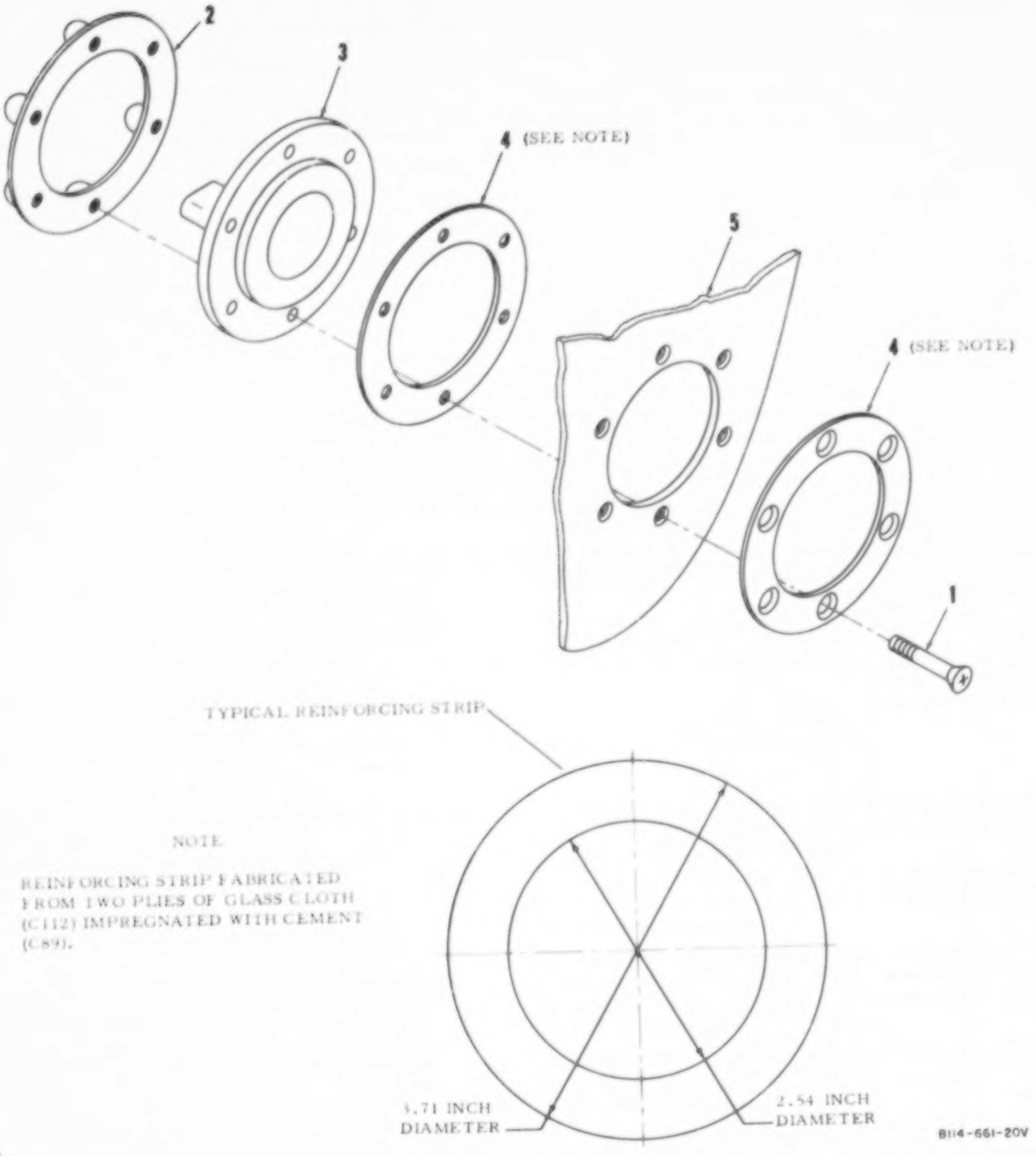
Take care to prevent cracking when drilling acrylic plastic. Make sure that the area to be drilled is well supported. Use a wooden backing block or suitable equivalent.

(c) Drill the securing screw holes at the 76 marked locations. Use a 60° $\frac{13}{32}$-inch drill. Drill the adapter securing screw holes at the 12 marked locations. Use a 60° $\frac{7}{32}$-inch drill. Countersink the 12 holes. Use a 100° countersink tool.

(d) Reposition the pane on the window frame. Check that the screw holes in the pane and frame are aligned.

(4) Install the screws and washers in the pane and frame. Apply a fillet seal between each screw and washer, and between each washer and the pane. Use sealant (C300 or C301). TORQUE THE SCREWS TO 10 TO 14 POUND-INCHES. Torque opposite screws alternately, working around the window.

(5) Apply a fillet seal around the pane edge, flush with the surrounding structure. Use sealant (C300 or C301).


2
3
4 (SEE NOTE)
5
4 (SEE NOTE)
1
TYPICAL REINFORCING STRIP
3.71 INCH DIAMETER
2.54 INCH DIAMETER
8114-661-20V

NOTE

REINFORCING STRIP FABRICATED FROM TWO PLIES OF GLASS CLOTH (C112) IMPREGNATED WITH CEMENT (C89).

42 x 45

1. Screw
2. Retainer
3. SAS port adapter
4. Reinforcing strip
5. Pane

Figure 2-21. Installation of SAS Ports (Sheet 2 of 2)

(6) Install the adapter (3) and retainer (2) in each SAS port mounting hole. Make sure the TOP mark is up. Loosely install the screws (1). Connect the SAS tubing and electrical cables to the adapter connectors. **TORQUE SCREWS TO 4 TO 6 POUND-INCHES.** Torque opposite screws alternately, working around the SAS port flange.

(7) Check SAS operation. (Refer to TM 11-1520-209-20.)

2-76. Tinting—Cockpit Crown Windows. Window tinting compound (C382) is used to reduce glare and heating in the cockpit crown windows (4 and 5, fig. 2-17) as follows:

a. Clean the cockpit windows. (Refer to para 2-67.)

b. Mask off the surrounding area to be tinted.

c. Make sure the area to be tinted is cool. Apply three coats of tint according to the manufacturer's directions printed on the container. Allow the tint to dry for 24 hours between coats.

2-77. Pilot and Copilot Jettisonable Doors.

a. See fig. 2-17. The pilot and copilot jettisonable doors are located on each side of the cockpit fuselage section. The jettisonable door assembly consists of a door assembly, two fixed assemblies, and a sliding pane assembly. The panes are made of acrylic plastic. The sliding pane assembly is attached to an aluminum alloy casting. A handle is provided above the top center of each door assembly for jettisoning of the door from inside the helicopter. An external handle is provided at the bottom and to the rear of each door assembly for jettisoning of the door from outside the helicopter.

b. On CH-47C helicopter 74-22287 and subq, the cockpit jettisonable door installations are modified to reduce the incidence of in-flight door loss resulting from vibration-induced disengagement of the door's upper latches. Refer to para 2-93.

c. On helicopters with MWO 55-1500-204-30-1, a pin and cable locking device, consisting of a floor lock and window lock, is installed to secure the pilot and copilot's jettisonable doors to prevent possible theft of the aircraft.

2-78. Cleaning. Refer to para 2-67.

2-79. Inspection—Jettisonable Door. (See fig. 2-22.) Inspect for the following conditions:

a. Window for freedom of operation. Burnished nicks, scratches, and dents. Check that any burnished areas do not interfere with operation of the sliding window or door.

b. Seals for deterioration.

c. Sliding window latch, door latch, and jettison mechanism for damage, also security in locked position (top and bottom), binding and corrosion.

2-80. Optical Requirements. See fig. 2-19 for transparent, acrylic pane assembly optical requirements. Refer to TM 55-1500-204-25/1 for general information on repair of pane assemblies. Refer to para 2-67(b) for surface refinishing of pane assemblies. Refer to para 2-544 for information on applying adhesive for the seal.

2-81. Functional Test.

CAUTION

To avoid damage to the latch plates, release both handles when removing the pilot's or copilot's jettisonable doors.

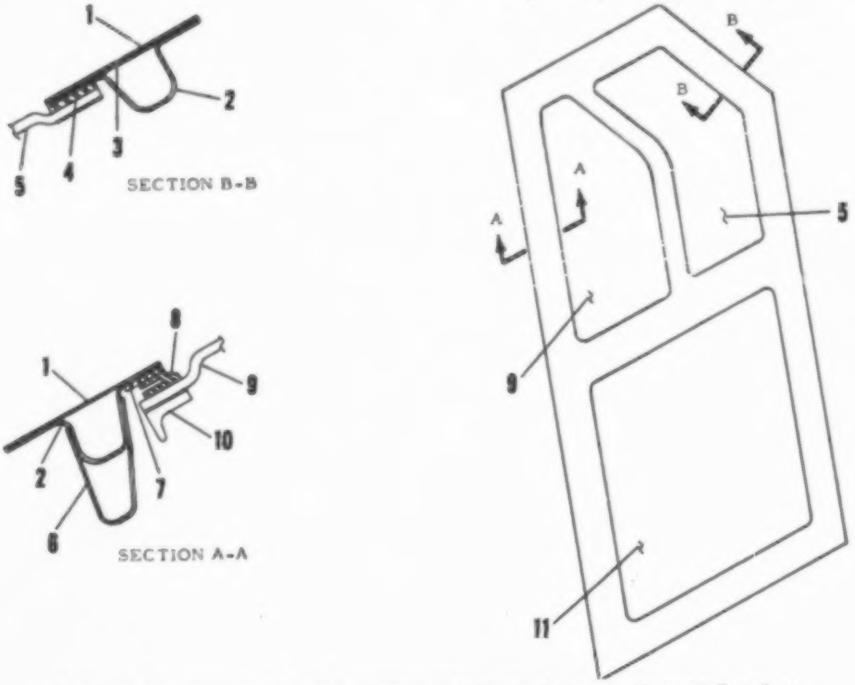


Figure 2-22. Pilot and Copilot Jettisonable Doors Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 2)

PILOT AND COPILOT JETTISONABLE DOORS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	OUTER SKIN	0. 025 2024-T4 CLAD	0. 032 2024-T3 CLAD	2-7
2	INNER PAN	0. 040 2024-T4 CLAD	0. 050 2024-T3 CLAD	--
3	DOUBLER	0. 020 2024-T4 CLAD	NOTE B.	2-7
4	SEAL	0. 125 SYN RUBBER SHEET	NOTE C.	--
5	PANE	0. 150 ACRYLIC PLASTIC	NOTE E.	FO-5
6	SUPPORT	0. 040 2024-T4 CLAD	0. 050 2024-T3 CLAD	--
7	SEAL	0. 090 SILICONE RUBBER SPONGE	NOTE C.	--
8	SEAL	MOLDED SILICONE RUBBER	NOTE D.	--
9	PANE	0. 150 ACRYLIC PLASTIC	NOTE E.	FO-5
10	FRAME	ALUMINUM ALLOY CASTING	NOTE F.	--
11	PANE	0. 187 ACRYLIC PLASTIC	NOTE E.	FO-5

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. DAMAGE TO DOUBLERS NECESSITATES REPLACEMENT OF DAMAGED PORTION WITH SAME MATERIAL AS ORIGINAL
C. REPLACE WITH NEW SEAL, ORIGINAL
D. REPLACE WITH NEW SEAL, 114SS668-1 OR -2
E. REFER TO PARA 2-64 AND 2-67 FOR REPAIR AND REFINISHING OF PANE ASSEMBLIES. REFER TO PARA 2-66 FOR OPTICAL REQUIREMENTS.
F. REPLACE WITH NEW PART, SAME AS ORIGINAL
G. THE LH DOOR IS SHOWN. REPAIR MATERIALS AND REFERENCED REPAIR FIGURES ARE SAME FOR RH DOOR

42x37

8114-181-348V

Figure 2-22. Pilot and Copilot Jettisonable Doors Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 2)

a. If installed, remove the jettisonable door floor and window security lock pins.

b. Press the PUSH button on the external release mechanism. The handle will spring out.

CAUTION

When the jettisonable door assembly is removed by using the internal upper jettison handle, the door assembly must be supported at the upper frame. This support restrains the outward and downward movement of the door.

c. Grasp the handle with one hand. Rotate the handle in the direction of the arrow. The latch shall release. Do not pull on the door: damage to the top latch plate can result.

d. (See fig. 2-24.) Insert a screwdriver thru the lower latch plate extension onto the latch shaft. Pull on the screwdriver to pull the door inboard.

e. Rotate the handle until the latch is engaged in the detent of the lower latch plate. Check for the red index line thru the inspection hole.

f. Grasp the internal release handle with one hand. Rotate the handle in the direction of the arrow. The latch shall release. Do not pull on the door: damage to the bottom latch plate can result.

g. Insert a screwdriver thru the upper latch plate extension onto the latch shaft. Pull on the screwdriver to pull the door inboard.

h. Rotate the handle until the latch is engaged in the detent of the upper latch plate. Check for the red index line thru the inspection hole.

i. If required, install the jettisonable door floor and window security lock pins.

2-82. Removal - Jettisonable Door.

CAUTION

To avoid damage to the latch plates, release both handles when removing the pilot's or copilot's jettisonable doors.

a. If installed, remove the jettisonable door floor and window security lock pins.

b. Support the door assembly, externally at the lower frame, to restrain outward and downward movement of the door.

CAUTION

When the jettisontable door assembly is removed by using the internal jettison handle, the door assembly must be supported at the upper frame. This support restrains the outward and downward movement of the door.

c. Rotate the external and internal jettison release handles in the direction indicated.

d. Allow the door assembly to separate from the helicopter. Remove the door.

2-82.1 INSTALLATION OF PHENOLIC BLOCKS AT BOTTOM OF JETTISONABLE DOOR.

See figure 2-23.1. CH-47 aircraft S/N 74-22287 and subsequent have two support brackets on the door frame at the bottom on each jettisonable door to prevent the door from slipping down and falling off the aircraft. The following instructions installs two phenolic blocks in approximately the same location for aircraft manufactured prior to S/N 74-22287.

CAUTION

To prevent damage to aircraft, ensure jettisonable door is installed and adjusted exactly as described in paragraph 2-93. Failure to accomplish this procedure correctly could cause the jettisonable door to be inadvertently lost during flight.

a. Install and adjust jettisonable door. Refer to paragraph 2-93.

b. Measure and record the distance between the door angle on the floor and the door to determine the height of the blocks.

c. Remove jettisonable door.

d. Fabricate two blocks from phenolic material (item 245, table 1-5) as follows:

(1) Cut blocks 2 inches long, 0.65 inches wide; and to the required height as determined in step b. Dress the blocks to fit the vertical leg of the door angle.

(2) Bevel the lower outer edge of the blocks 0.12 inches by 45° for clearance with the radius of the door angle.

(3) Drill shallow relief holes in the blocks for clearance with rivet heads and seal retaining tab.

e. On aircraft 63-7915 and subsequent, perform the following steps:

(1) Trim small flange at top of seal angle sufficiently to clear blocks.

(2) Radius the corners of the cutout to a 0.12 radius.

WARNING

Solvents, paints and adhesives used in the following steps are toxic and flammable. Work in a well ventilated area and avoid skin contact with the adhesive.

f. Sand the paint from the area where the blocks will be bonded. Clean all bonding surfaces with aliphatic naphtha type II (item 217, table 1-5) or methyl-ethyl-ketone (item 216, table 1-5).

g. Bond phenolic blocks in place with epoxy adhesive (C32).

Legend for figure 2-23

1. Inspection hole
2. Detent housing
3. Pin
4. Bolt
5. Upper bellcrank
6. Upper link
7. Rod end
8. Slider tube
9. Bolt
10. Lower link
11. Bolt
12. Rod end
13. Locknut
14. Overcenter stop
15. Bolt
16. Rod end
17. Bolt
18. Slider tube
19. Bolt
20. Rod end
21. Overcenter stop
22. Bushing
23. Bolt
24. Rod end
25. Rod end
26. Center post
27. Nut
28. Washer
29. Bushing
30. Bushing
31. Nut
32. Washer
33. Washer
34. Light washer
35. Bushing
36. Bushing
37. Seal
38. Screw
39. Screw
40. Screw
41. Washer
42. Light washer
43. Washer
44. Nut
45. Handle
46. Sliding window
47. Frame
48. Screw
49. Light washer
50. Nut
51. Screw
52. Nut
53. Washer
54. Seal
55. Screw
56. Washer
57. Light washer
58. Nut
59. Retainer
60. Upper fixed window
61. Seal
62. Handle
63. Nut
64. Washer
65. Pin
66. Shaft
67. Stop
68. Support assembly
69. Pin
70. Latch
71. Washer
72. Cotter pin
73. Pin
74. Lever
75. Washer
76. Nut
77. Shaft
78. Pin
79. Cotter pin
80. Washer
81. Latch
82. Pin
83. Washer
84. Cotter pin
85. Support assembly
86. Plate
87. Seal
88. Lower fixed window
89. Screw
90. Nut
91. Screw
92. Washer
93. Washer
94. Nut
95. Retainer

h. After epoxy has cured, restore primer and paint around the edge of the blocks.

NOTE

Maximum allowable gap between the door channel and top of phenolic blocks is 1/16 (0.062) inch.

i. Install and adjust jettisonable door. Refer to paragraph 2-93.

j. Repeat procedure for opposite jettisonable door.

2-83. Repair. (See fig. 2-22.) Damage which can be corrected by a simple procedure, such as stop-drilling cracks and removal of small dents and damaged areas, is permissible for formed metal parts. See fig. 2-3 for examples of damage to formed metal parts.

Damage exceeding the negligible damage limits can be repaired by patching if door edges are not affected. Complete damage to formed metal parts should be repaired by insertion, except damage occurring at door edges. Refer to TM 55-1500-204-25/1 for information on repair of formed parts, spotweld repairs, and acrylic plastic. If required, the reinforcement strips on the edges of panes can be cemented using cement (C92). Butt joint gaps must not exceed 0.10 inch and should be filled with cement. Refer to para 2-536 for information on application of cement. Extensive damage, such as the loss of a major portion of the door or damage affecting the seal, necessitates replacement in whole or in part. Replace damaged seal with a new seal VS80573, using adhesive. Refer to para 2-546.

2-84. Cleaning—Sliding Window Slider Tubes. (See fig. 2-23.) Clean the sliding window slider tubes (8 and 18) with a clean, lint-free cloth (C104). Use a cloth damp with water, if necessary, to clean the slider tubes. Do not lubricate the slider tubes.

CAUTION

Do not lubricate the slider tubes. Lubricants will attract dirt particles which could cause the sliding window to stick.

2-85. Removal—Sliding Window Plastic Panel. (See fig. 2-23.)

a. Remove the jettisonable door assembly. (Refer to para 2-82.)

b. Remove nut (27), bolt (23), bushings (29 and 30), and washers (28). Free the slider tube (18) from the rod end (24).

c. Remove the nut (31), bolt (11), bushings (35 and 36), and washers (32, 33, and 34). Free the slider tube (8) from the rod end (25).

d. Loosen locknut (13). Note the amount of rod end (12) threads. Remove the rod end from the slider tube (8).

e. Remove the sliding window assembly frame (47) from the slider tubes (8 and 18).

f. Remove the seal (37) from the window assembly.

g. Remove the screws (38, 39, and 40), washers (41, 42, and 43), and the nuts (44).

h. Remove the handle (45). Separate the plastic panel (46) from the frame (47).

2-86. Installation—Sliding Window Plastic Panel. (See fig. 2-23.)

a. Install a layer of sealant tape (C307) around the back of the window pane, over the surface that fits to the frame.

b. Clean the front of the plastic window pane (46) in the area where the seal (37) is to be installed. Use naphtha (C217).

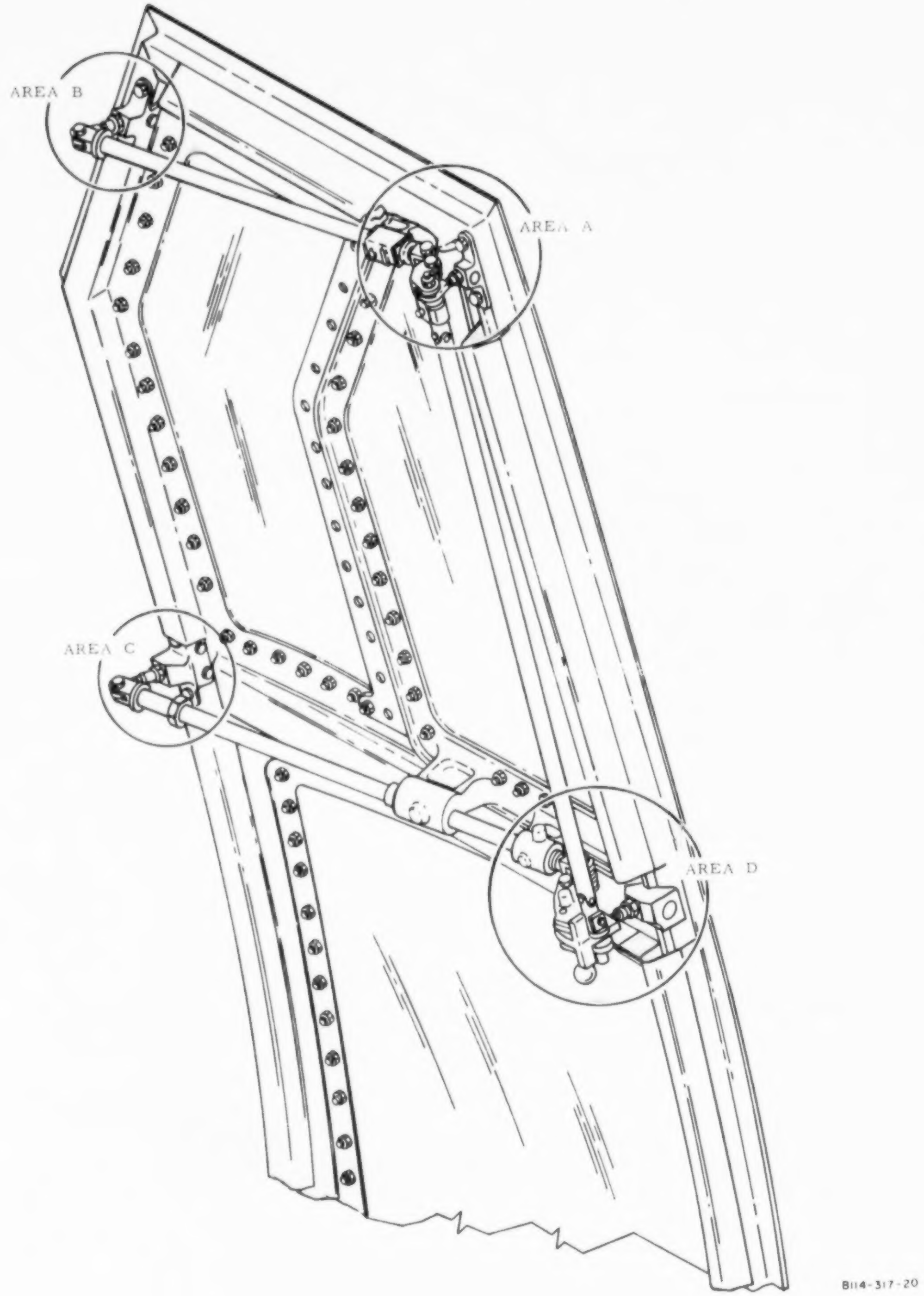

AREA B
AREA A
AREA C
AREA D
B114-317-20

Figure 2-23. Jettisonable Door (Sheet 1 of 4)

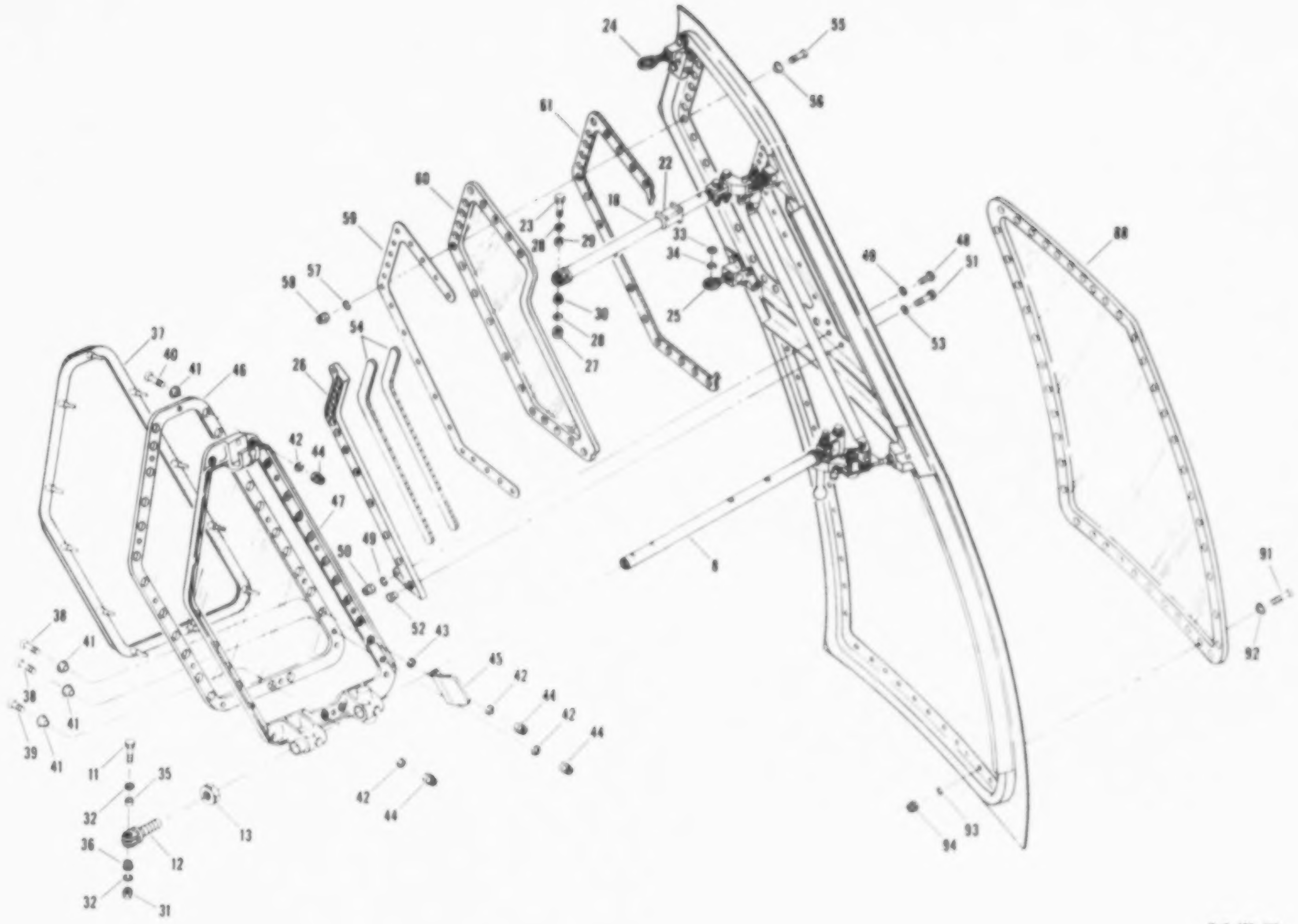

24
55
56
61
22
18
60
23
28
29
59
33
34
49
48
51
58
57
25
53
30
28
27
88
54
37
40
41
46
26
42
44
47
8
50
49
91
38
41
52
43
92
45
42
38
44
41
42
39
41
44
11
35
32
13
42
44
36
12
94
93
32
31

Figure 2-23. Jettisonable Door (Sheet 2 of 4)

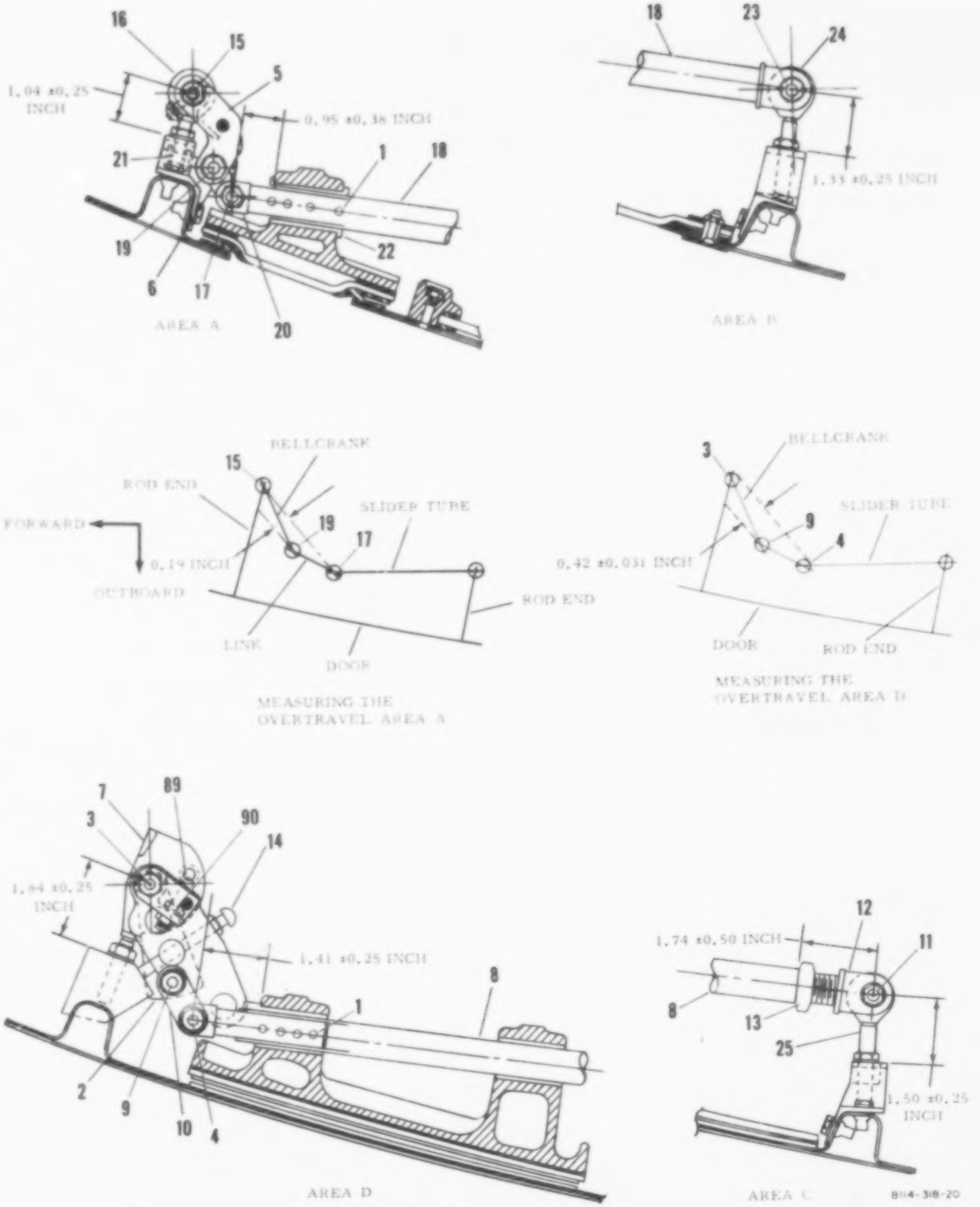

16
15
5
1.04 ±0.25 INCH
0.95 ±0.38 INCH
21
1
18
19
22
6
17
20
AREA A
18
23
24
1.33 ±0.25 INCH
AREA B
BELLCRANK
15
ROD END
SLIDER TUBE
19
17
FORWARD
0.19 INCH
OUTBOARD
ROD END
LINK
DOOR
MEASURING THE OVERTRAVEL AREA A
3
BELLCRANK
SLIDER TUBE
9
4
0.42 ±0.031 INCH
DOOR
ROD END
MEASURING THE OVERTRAVEL AREA D
7
89
3
90
14
1.84 ±0.25 INCH
1.41 ±0.25 INCH
8
1
2
9
10
4
AREA D
12
1.74 ±0.50 INCH
11
8
13
25
1.50 ±0.25 INCH
AREA C
B114-318-20

Figure 2-23. Jettisonable Door (Sheet 3 of 4)

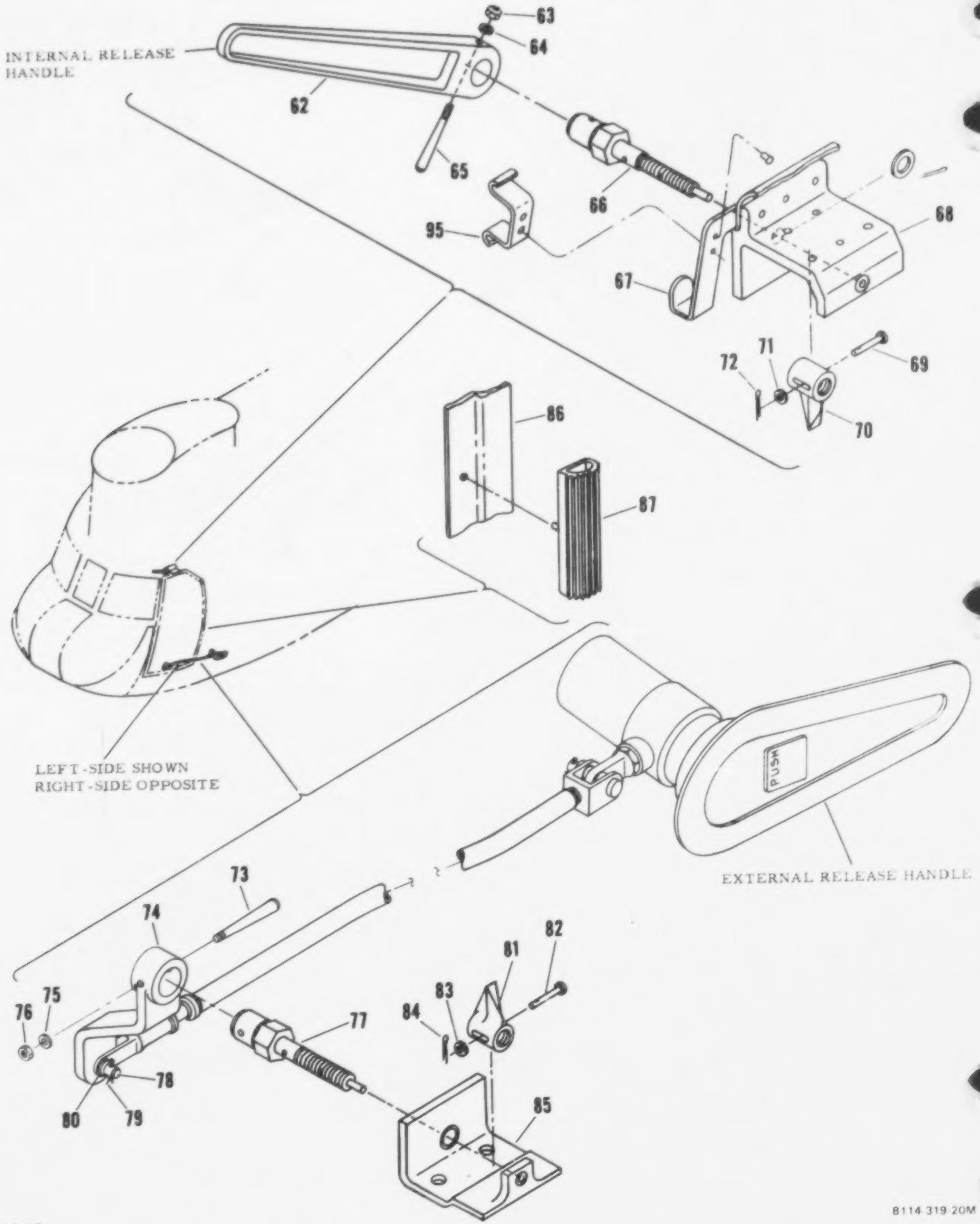

63
64
INTERNAL RELEASE HANDLE
62
65
66
95
68
67
71
72
69
70
86
87
LEFT-SIDE SHOWN RIGHT-SIDE OPPOSITE
PUSH
EXTERNAL RELEASE HANDLE
73
74
82
81
83
84
77
76
75
78
80
79
85
B114 319 20M
42 x 52

Figure 2-23. Jettisonable Door (Sheet 4 of 4)

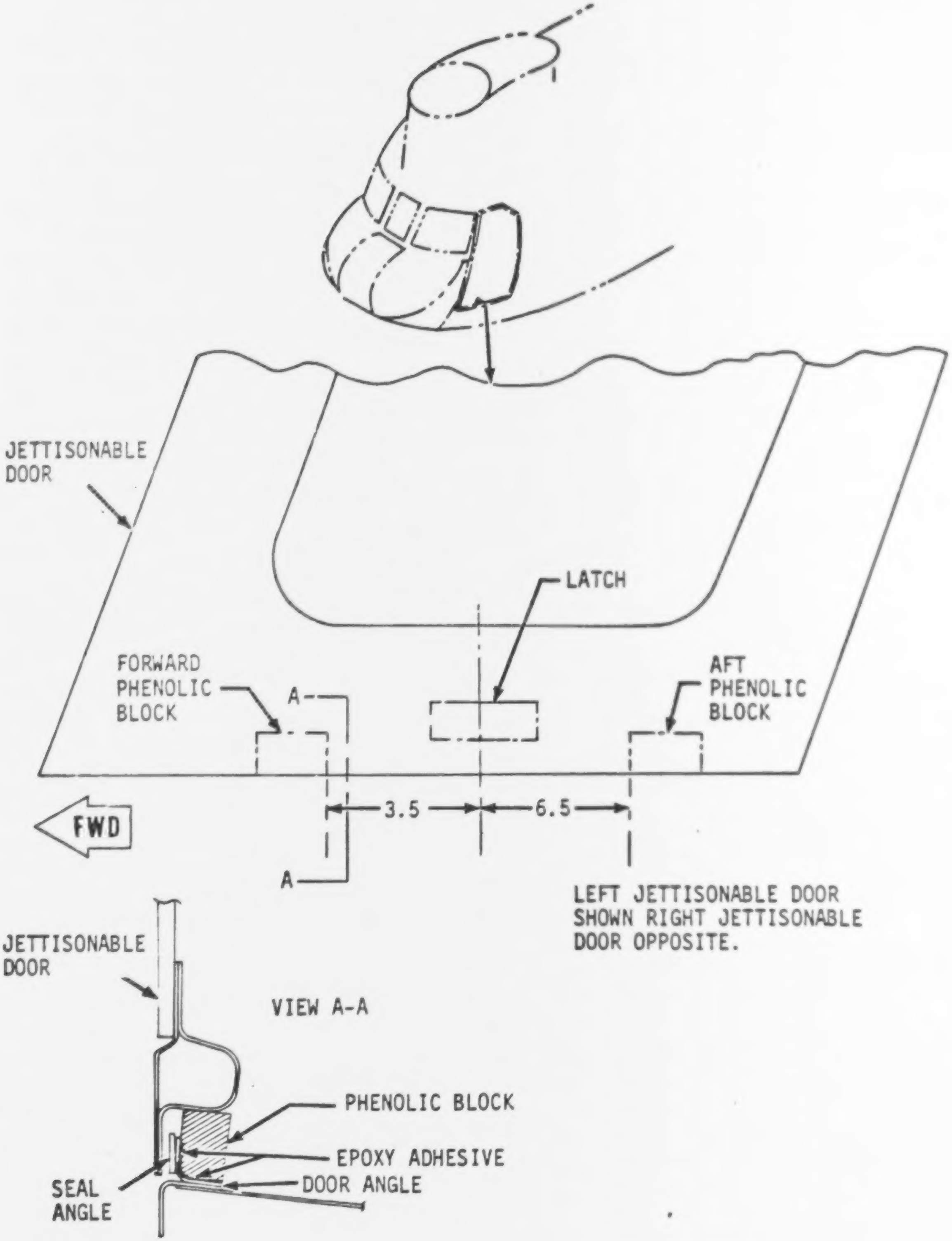

JETTISONABLE DOOR
LATCH
FORWARD PHENOLIC BLOCK
A
AFT PHENOLIC BLOCK
3.5
6.5
FWD
A
LEFT JETTISONABLE DOOR SHOWN RIGHT JETTISONABLE DOOR OPPOSITE.
JETTISONABLE DOOR
VIEW A-A
PHENOLIC BLOCK
EPOXY ADHESIVE
DOOR ANGLE
SEAL ANGLE

Figure 2-23.1. Installation of Phenolic Blocks at Bottom of Jettisonable Door

c. Fit the plastic window pane (46) and the handle (45) to the frame (47). Install screws (38, 39, and 40), washers (41, 42, and 43), and nuts (44).

d. TORQUE SCREWS (38, 39, AND 40) TO 10 TO 14 POUND-INCHES.

e. Apply a coat of adhesive (C14) to the faying surface of the seal (37). Install the seal on the plastic window pane.

f. Trim the seal (37) to within 1/16-inch of the frame (47).

g. Position the sliding window assembly frame (47) back onto the slider tubes (8 and 18).

h. Turn the rod end (12) back into the slider tube. Make sure that the same amount of thread is showing as when removed. Tighten the locknut (3).

i. Attach the slider tube (8) to the rod end (25). Use the bolt (11), bushings (35 and 36), washers (32, 33, and 34), and the nut (31).

j. Attach the slider tube (18) to the rod end (24). Use the bolt (23), bushings (29 and 30), washers (28), and the nut (27).

k. Adjust the sliding window. (Refer to para 2-87).

l. Functionally test the sliding window assembly. (Refer to para 2-88).

m. If more than 15 pounds is required to slide the window, proceed as follows:

(1) Remove the window from slider tubes (8 and 18).

(2) Ream the two nylon bushings that slide on the slider tube (8), as necessary, to permit free sliding. Do not exceed 0.786-inch inside diameter.

(3) Remove the clevis from the aft end of the slider tube (18). Slide the bushing (22) from the tube.

(4) Ream the bushing (22) as necessary to permit free sliding. Do not exceed 0.786-inch inside diameter.

(5) Install the bushing (22) and the clevis on the slider tube (18).

(6) Install the window on the slider tubes.

n. Install the jettisonable door assembly. (Refer to para 2-93.)

2-87. Adjustment—Sliding Window. (See fig. 2-23.)

a. Close the sliding window. Check the lower link (10) and the detent housing (2) for an overtravel distance of 0.389 to 0.451 inch as follows:

(1) Place a straightedge from the pin (3) in the torque tube rod end (7) to the bolt (4) in the slider tube (8) as shown in fig. 2-23.

(2) Measure the overtravel distance from the straightedge to the center of the bolt (19) in the link (6). The measurement shall be 0.389 to 0.451 inch.

(3) If the 0.389 to 0.451-inch dimension is not obtained, remove the rod end bolt (11). Loosen the locknut (13). Adjust the slider tube rod end (12) and the overcenter stop (14). Check the inspection holes (1) in the slider tube end for rod end thread engagement after the adjustment is made. TORQUE THE LOCKNUT (13) TO 100 POUND-INCHES.

NOTE

Make sure the dimensions given in fig. 2-23 are not exceeded.

b. With the sliding window closed, check the upper bellcrank (5) and the upper link (6) for an overtravel distance of 0.159 to 0.221 inch as follows:

(1) Place a straightedge from the center of the bolt (15) in the rod end (16) to the center of the bolt (17) in the slider tube (18).

(2) Measure the overtravel distance from the straightedge to the center of bolt (19) in link (6). The measurement shall be 0.159 to 0.221 inch.

(3) If the 0.159 to 0.221 inch measurement is not obtained, remove the rod end bolt (17). Adjust the slider tube rod end (20) and the overcenter stop (21). Check the inspection holes (1) in the slider tube end for thread engagement after the adjustment is made.

NOTE

Make sure the dimensions given in fig. 2-23 are not exceeded.

c. Check that the sliding window fairs to the door contour within ±0.06 inch.

d. If the window does not fair to the door contour within ±0.06 inch, remove the rod end bolts (15, 23, and 11) or pin (3), as necessary and adjust the rod ends (16, 24, 7, and 25) as required. TORQUE THE ROD END LOCKNUTS TO 60 TO 85 POUND-INCHES.

NOTE

Make sure the dimensions given in fig. 2-23 are not exceeded.

e. Make sure that the forward detent hole in the lower slider tube (8) coincides with the window closed position (ball in hole). If an adjustment is necessary, loosen the locknut (13). Rotate the slider tube (8) until the detent hole coincides with the closed position. TORQUE THE LOCKNUT TO 100 POUND-INCHES.

f. Open the sliding window. Make sure that the sliding window clears the center post (26) by a minimum distance of 0.12 inch when the detent is in the fully open position (ball in hole). To obtain the dimension, loosen the nut (90) and adjust the open position stop screw (89) until the minimum distance is obtained. Then repeat step a.

2-88. Functional Test of Sliding Window. (See fig. 2-23).

a. Obtain a dial indicating scale capable of measuring 0 to 75 pounds.

b. Open the window using the dial indicating scale. THE PEAK LOAD REQUIRED TO UNLOCK THE WINDOW OPERATING MECHANISM MUST NOT EXCEED 50 POUNDS.

c. Slide the window using the dial indicating scale. THE PEAK LOAD REQUIRED TO SLIDE THE WINDOW PAST THE THREE DETENTS MUST NOT EXCEED 15 POUNDS.

d. Close the window using the dial indicating scale. THE FORCE REQUIRED TO UNLOCK THE WINDOW OPERATING MECHANISM MUST NOT EXCEED 50 POUNDS. If more than 15 pounds are required to slide the window, ream the slider bushings. (Refer to para 2-86).

2-89. Removal—Upper Fixed Window. (See fig. 2-23.)

a. Remove the screws (48), washers (49 and 53), nuts (50 and 52), screws (51), the center post (26), and the seal (54).

b. Remove the screws (55), washers (56), washers (57), nuts (58), and the retainer (59).

c. Remove the plastic panel (60) and the seal (61).

2-90. Installation—Upper Fixed Window Plastic Panel. (See fig. 2-23.)

a. Position a new seal (61) and plastic panel (60) on the frame.

b. Place the retainer (59) over the plastic panel. Align the screw holes.

c. Install the screws (55), washers (56), washers (57), and nuts (58).

d. Install the seal (54) and the center post (26). Secure the post with the screws (48 and 51), washers (49 and 53), and nuts (50 and 52).

e. TORQUE ALL THE SCREWS TO 10 TO 14 POUND-INCHES.

f. Install the jettisonable door assembly. (Refer to para 2-93.)

2-91. Replacement—Lower Fixed Window. (See fig. 2-23.)

a. Remove the screws (91) and the washers (92 and 93), and nuts (94) from around the window (88).

b. Remove the window (88).

c. Position the window (88) on the sealant tape (C307) on the supporting framework.

d. Install the screws (91), washers (92 and 93), and nuts (94) loosely around the window (88).

e. TORQUE THE SCREWS (91) ALTERNATELY, 180° APART, AROUND THE WINDOW TO 10 TO 14 POUND-INCHES.

2-92. Modification—Shaft Support Assembly Leg. (See fig. 2-24.) The upper and lower shaft support assembly legs project into the latch plate area to prevent lateral movement of the door. If the dimension for either shaft support assembly leg in fig. 2-24 is not met, perform the following modification:

a. Remove the jettisonable door assembly. (Refer to para 2-82.)

b. Make an extension for the shaft support assembly leg. Use steel or aluminum stock ¼-inch thick. Form the extension as necessary to meet the nominal ¼-inch dimension in fig. 2-24.

c. Drill two 0.191-inch holes through the extension leg and the shaft support assembly leg. Use a No. 11 drill. Clean and deburr the holes.

d. Secure the extension leg to the shaft support assembly leg with two screws AN525-10-12, two nuts AN363-10-32, and two washers AN960-10.

e. Install the jettisonable door assembly. (Refer to 2-93.)

2-93. Installation and Adjustment - Jettisonable Door (figure 2-24).

a. Reinstall the same door on the helicopter as follows:

(1) Position the jettisonable door assembly in the door opening.

(2) Insert a screwdriver thru the upper latch plate extension onto the latch shaft. Pull on the screwdriver to pull the door inboard.

(3) Rotate the upper handle until the latch is engaged in the detent of the upper latch plate. Check for the red index line thru the inspection hole.

(4) Insert a screwdriver thru the lower latch plate extension onto the latch shaft. Pull on the screwdriver to pull the door inboard.

(5) Rotate the lower handle until the latch is engaged in the detent of the lower latch plate. Check for the red index line thru the inspection hole.

(6) Push in and lock the lower handle.

b. Install a new door on the helicopter as follows:

CAUTION

If the door is not installed and adjusted exactly as directed in this procedure, the door could be lost in flight.

(1) (Fig. 2-23) Inspect seal (87) around the door frame for damage or poor sealing quality. Replace the seal if either condition exists. Secure the seal with adhesive (C18).

(2) Prepare the upper jettison mechanism as follows:

(a) Remove nut (63), washer (64), and pin (65) which secure handle (62) to shaft (66).

(b) Remove cotter pin (72), washer (71) and pin (69) which lock latch (70) to threaded shaft (66) of the jettison mechanism.

NOTE

Shafts (66 and 77) of the upper and lower jettison mechanisms are not interchangeable. If the shafts have been removed and being reinstalled, the longer shaft (66) is part of the upper jettison mechanisms.

(3) Check the latches for correct contact with the latch plates (fig. 2-25). If necessary, shim under the latch plates with washer AN960D10 to obtain correct contact. (fig. 2-24) Turn shafts (2 and 3) to move latches (4 and 5) inboard until door can be held in position. Do not tighten shafts.

(4) Check for 45/64-inch clearance between latch plate (6) and shaft (2). Check for 41/64-inch clearance between latch plate (7) and shaft (3) at bottom of door. If necessary, loosen upper bolt (8) and screws (10). Also if necessary, loosen lower bolt (9) and screws (11). Inspect the door-to- fuselage fit. Make sure the door fits flush. Make sure it is not overriding the fuselage at any point. Adjust the door to obtain proper fit.

(5) If engagement is not 41/64-inch minimum, install a shim between the shaft support assembly and the upper sill. Shims should be 1.5 by 2.1 inches and should not exceed 0.090 inch thick. Use 2024-T3 aluminum alloy sheet. Existing rivet holes can be used. Elongated holes in the base for bolts AN3-7A are acceptable.

(6) Check that latches (4 and 5) are positioned in the detent of each latch plate (6 and 7). Make sure the ends of the latches are not resting in inspection holes in latch plates.

(7) If bolts (8 and 9) and screws (10 and 11) were loosened, tighten them to secure latch plates (6 and 7).

CAUTION

If shaft pilot (12) is not in the hole in the shaft support assembly, the door could be lost in flight.

(8) Check that shaft pilot (12) of shafts (2 and 3) are in the holes in the shaft support assembly.

(9) WITH THE DOOR PROPERLY FITTED AND THE LATCHES (4 AND 6) ALIGNED IN THE DETENTS OF THE LATCH PLATE, TORQUE THE SHAFTS (2 AND 3) OF THE UPPER AND LOWER JETTISON MECHANISMS TO 20 TO 25 POUND-INCHES.

CAUTION

If the door is not properly fitted to the airframe, or if the latches are not properly positioned in the latch plate detents, the door could be lost in flight.

(10) Again inspect the door-to-airframe fit. Make sure the door fits flush. Make sure it is not overriding the airframe at any point. If there is a slight overlap, minor trimming is allowed. Check that latches (4 and 5) are properly positioned in the latch plate detents. Make sure the ends of the latches are not resting in inspection holes in latch plates.

(11) (Fig. 2-23) If necessary, turn shaft (66) on the upper jettison mechanism within the 20 to 25 pound-inch range to align the hole in the shaft with the slot in latch (70). Install pin (69) thru the holes in the two parts. Secure the pin with washer (71) and cotter pin (72).

(12) Inspect retainer (95) for security and damage. Make sure the retainer will hold handle (62) in the closed position.

CAUTION

Make sure that handle (62) is secure in retainer (95). If the handle is not secure in the retainer, the door could be lost in flight.

(13) Position handle (62) on shaft (66) and in retainer (95) of the upper jettison mechanism. Do not turn the shaft while fitting the handle. Secure the handle with pin (65), washer (64), and nut (63).

(14) If necessary, turn shaft (77) on the lower jettison mechanism within the 20 to 25 pound-inch range to align the hole in the shaft with the slot in latch (81). Install pin (82) thru the holes in the two parts. Secure the pin with washer (83) and cotter pin (84).

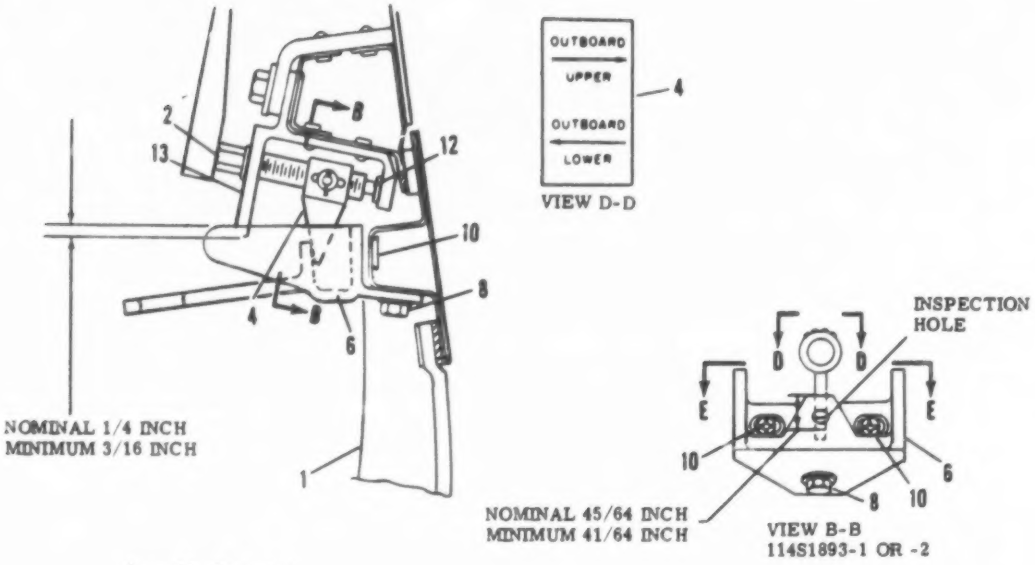
NOTE

Lower latch (74) uses tappered pin (73), P/N AN386-1-8A on helicopters 59-4982 thru 68-15856, and bolt, P/N AN173C13A, used on helicopters 68-15857 and subsequent.

(15) Install lever (74) on shaft (77) of the lower jettison mechanism. Secure the lever with pin (73), washer (75), and nut (76). Do not turn the shaft while fitting the lever.

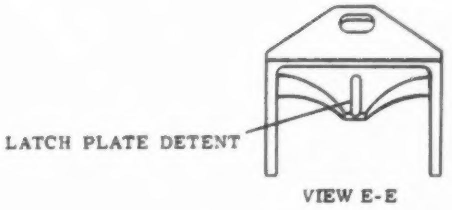
(16) Slide the flexible coupling over the defroster duct. Tighten the ratchet clamp.

(17) Install the protective cover over the lower jettison mechanism.


2
13
B
12
10
8
4
B
6
1
NOMINAL 1/4 INCH
MINIMUM 3/16 INCH
OUTBOARD
UPPER
OUTBOARD
LOWER
4
VIEW D-D
INSPECTION HOLE
D
D
E
E
10
6
8
10
NOMINAL 45/64 INCH
MINIMUM 41/64 INCH
VIEW B-B
114S1893-1 OR -2

Legend for figure 2-24

1. Jettisonable door
2. Upper shaft
3. Lower shaft
4. Upper latch
5. Lower latch
6. Upper latch plate
7. Lower latch plate
8. Bolt
9. Bolt
10. Screw
11. Screw
12. Shaft pilot
13. Upper shaft support assembly
14. Lower shaft support assembly


LATCH PLATE DETENT
VIEW E-E

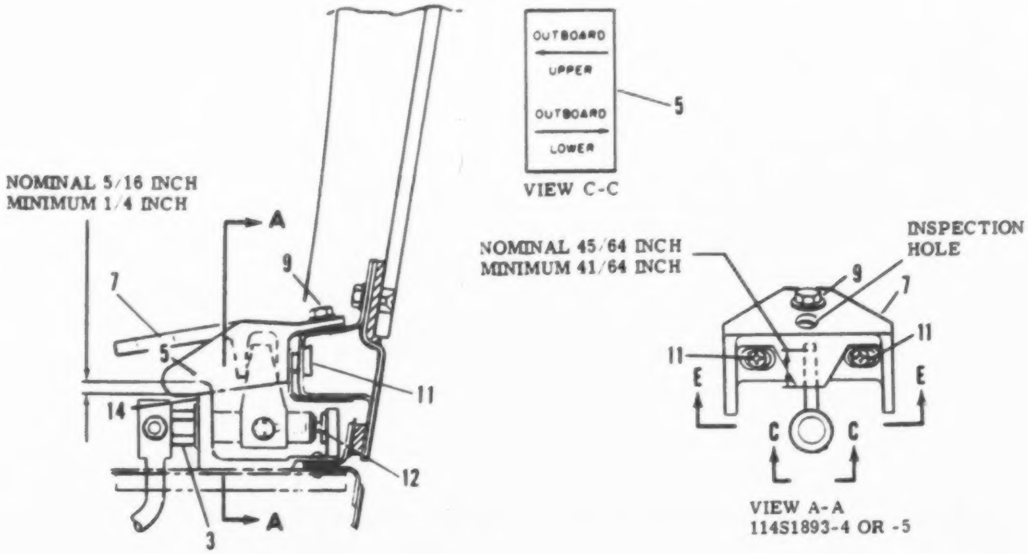
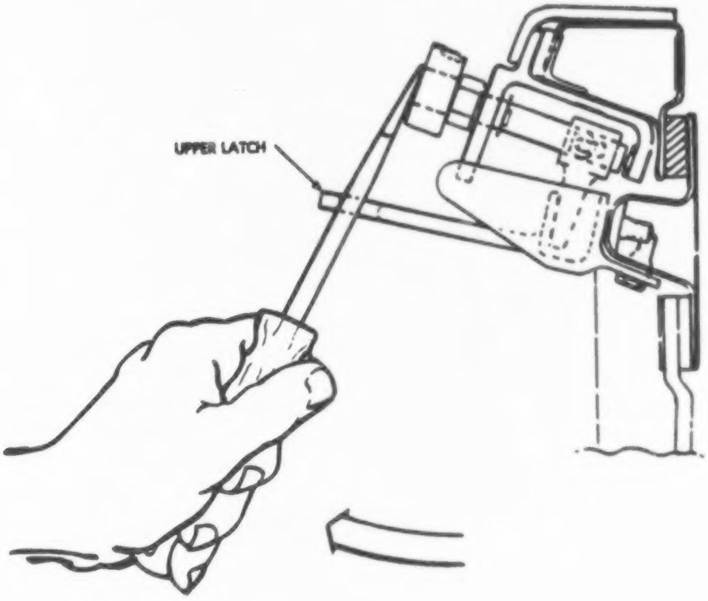

OUTBOARD
UPPER
OUTBOARD
LOWER
5
VIEW C-C
NOMINAL 5/16 INCH
MINIMUM 1/4 INCH
A
9
7
5
11
14
12
3
A
NOMINAL 45/64 INCH
MINIMUM 41/64 INCH
INSPECTION HOLE
9
7
11
11
E
E
C
C
VIEW A-A
114S1893-4 OR -5

Figure 2-24. Installation and Adjustment of Pilot's and Copilot's Jettisonable Door (Sheet 1 of 2)

COCKPIT JETTISONABLE DOOR INSTALLATION


UPPER LATCH

PULL DOOR INWARD THEN ENGAGE LATCHES

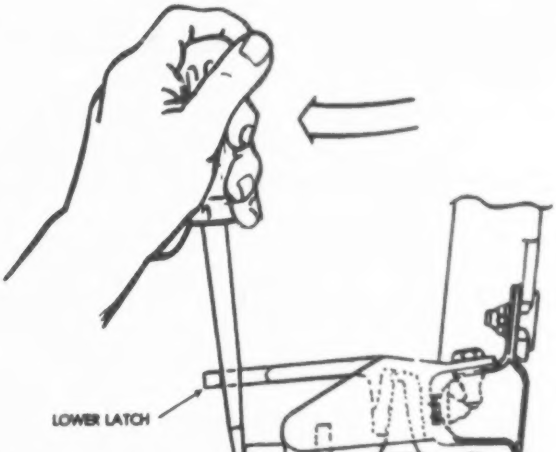
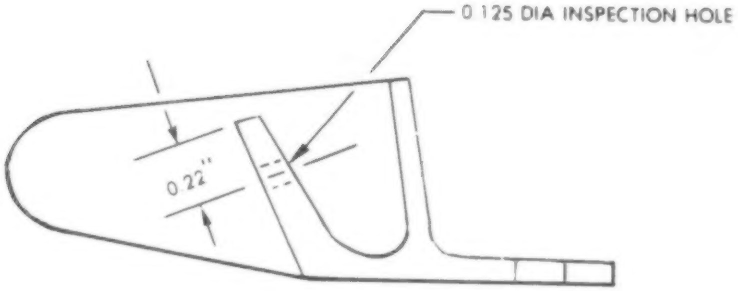
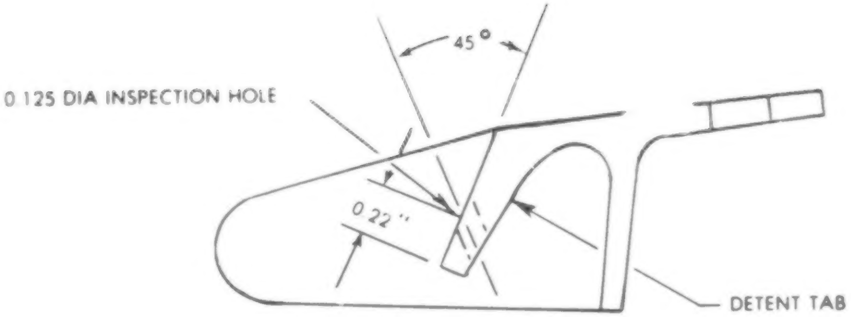

LOWER LATCH

Figure 2-24. Installation and Adjustment of Pilot's and Copilot's Jettisonable Door (Sheet 2 of 2)


0.125 DIA INSPECTION HOLE
0.22"

UPPER LATCH PLATE


45°
0.125 DIA INSPECTION HOLE
0.22"
DETENT TAB

LOWER LATCH PLATE

Figure 2-24.1. Latch Plate Inspection Hole

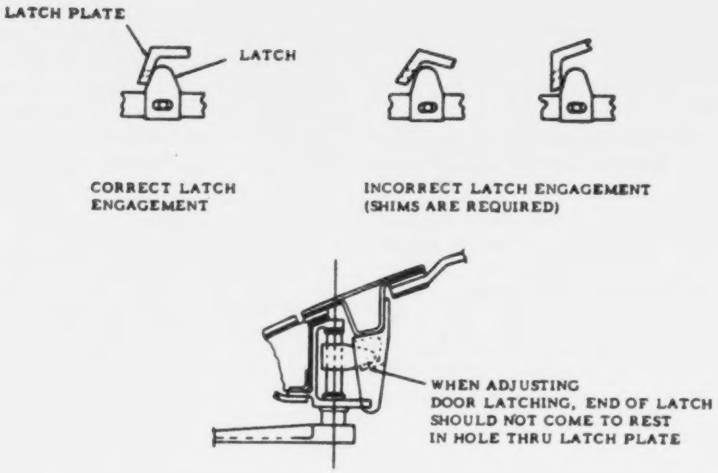

LATCH PLATE
LATCH
CORRECT LATCH ENGAGEMENT
INCORRECT LATCH ENGAGEMENT (SHIMS ARE REQUIRED)
WHEN ADJUSTING DOOR LATCHING, END OF LATCH SHOULD NOT COME TO REST IN HOLE THRU LATCH PLATE

Figure 2-25. Latch and Latchplate Adjustment

2-94. Inspection of Installation. (See fig. 2-24.) Inspect the jettisonable door for proper installation, fit, and security, as follows:

a. Inspect the door-to-airframe fit. Make sure that the door fits flush. Make sure that it is not overriding the airframe at any point.

b. Inspect the latch (4 and 5) position in the detent of each plate (6 and 7).

c. Check that the pilot (12) of each shaft (2 and 3) is in the hole of each shaft support assembly.

d. (See fig. 2-23.) Inspect the retainer (95) for security and damage. Also, check that the handle (62) is held securely in the retainer.

e. (See fig. 2-24.) Inspect the upper shaft support assembly (13) leg for required projection into the upper latch plate (6) area. If the required projection is not met, modify the shaft support assembly leg. (Refer to para 2-92.)

f. Inspect the lower shaft support assembly (14) leg for required projection into the lower latch plate (7) area. If the required projection is not met, modify the shaft support assembly leg. (Refer to para 2-92.)

2-95. Cockpit Fairings, Access Door, and Panels.

The fixed fairing has a forward and aft section. See fig. 2-26.

a. The forward section consists of inner and outer skins of aluminum alloy and formers attached between the skins to maintain the contour. A tube is riveted to the outer skin and formers where contact is made with the forward pylon hinged fairing. An extruded T-section and formed angles and channels continue the contour of the fairing from the forward section, around the forward transmission, to the aft section.

b. The aft section consists of side and top skins made of laminated, plastic-impregnated glass cloth. Formers and stiffeners are attached to the skins and maintain the contour in the aft section.

c. The two hinged fairings, right and left, open for maintenance. When opened they form work platforms that will support 400 pounds. For information concerning the work platforms, refer to para 2-104.

d. The components warranting classifications of damage and repair information are the forward pylon fixed fairings; forward pylon hinged fairings (work platforms); nose compartment door, pilots' jettisonable doors, cabin door on the rh side, and the escape hatch on the lh side of the fuselage.

2-96. Inspection of Fairing. (See fig. 2-26.) Inspect for the following conditions:

a. Seals for deterioration.

b. Missing or loose rivets and screws.

c. Spoilers (fig. 2-28) for damage and for loose rivets.

d. Cracks and other obvious damage. Nicks, dents, and scratches that can be removed by burnishing are negligible. Cracks and small round or oval holes not exceeding the limits shown in fig. 2-6, are permissible provided that they can be temporarily patched. Damage must not interfere with the operation of the adjacent hinged fairing. See fig. 2-3 for examples of negligible damage to formed parts.

2-97. Removal. (See fig. 2-26.)

a. Open the forward transmission left and right hinged fairings (work platforms).

b. Remove screws (1) and washers from the forward (2) and aft fairing (3).

c. Remove bolts (4) and washers securing the forward fairing (2) to the transmission mounting structure.

d. Remove screws (5) and washers from the base of the forward fairing (2). Remove the fairing.

e. Disconnect the oil indicator light electrical connector.

f. Remove bolts (6) and washers securing the aft fairing (3) to the transmission mounting structure at sta 120.

g. Remove screws (7) and washers securing the aft fairing (3) to the brackets at sta 140.

h. Remove screws (8) and washers from the base of the aft fairing (3). Remove the fairing.

2-98. Repair. See fig. 2-27 for forward pylon structure and fairing repairs.

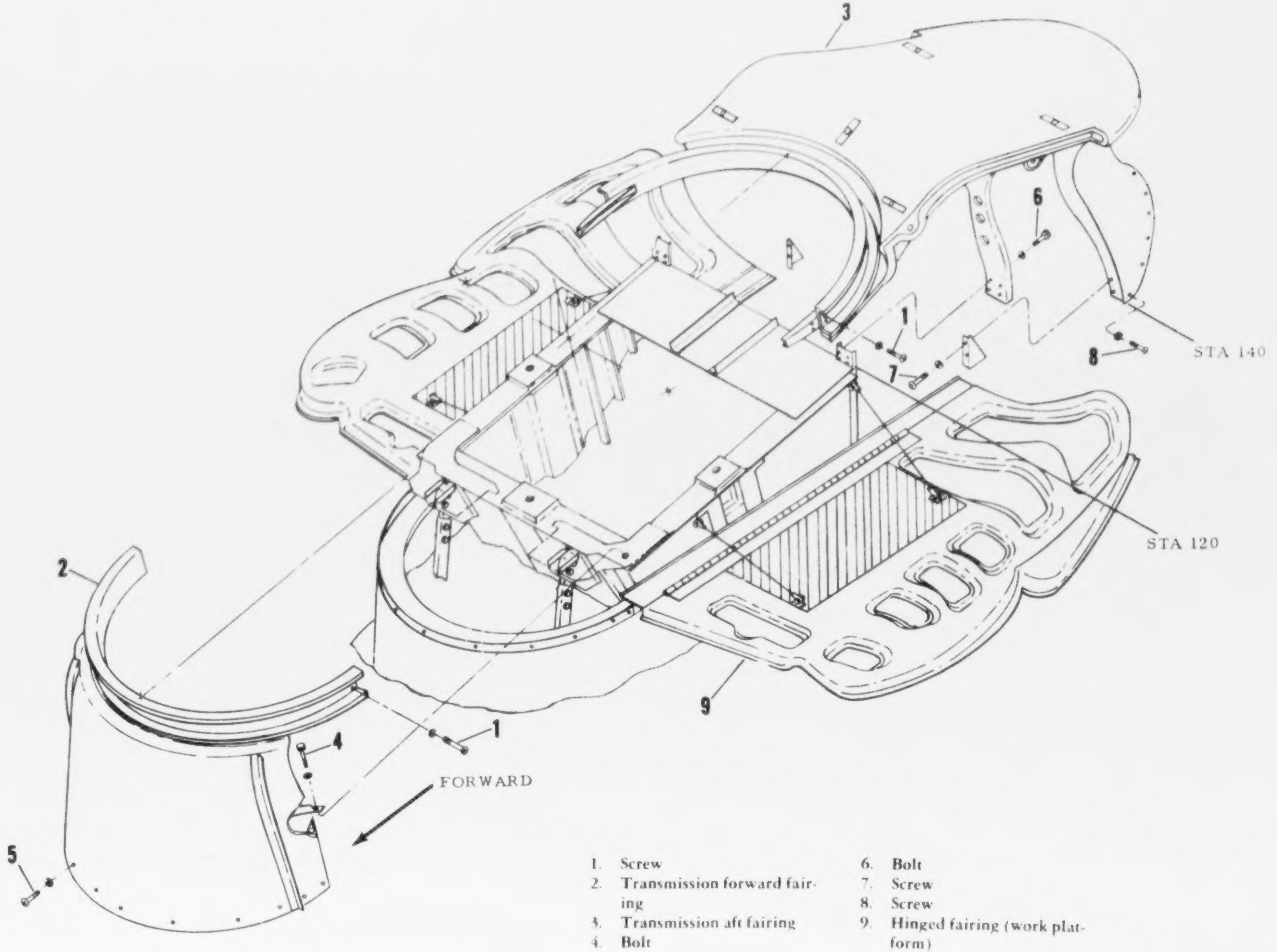
a. Damage affecting less than 25 percent of the area of a skin panel, can be repaired by patching. Damage to formed parts not affecting the radius can be repaired by patching.

b. (AVIM). Damage affecting more than 25 percent of the area of a skin panel or which affects boundary members should be repaired by insertion. Damage to formed parts affecting the radius must be repaired by insertion. See fig. 2-7 for typical repairs to metal skins. See fig. 2-27, sheet 4 for location of phase plate attaching hardware, if repairs are made in that area. Extensive damage, such as the loss of a major portion of a member or numerous isolated damages, necessitates replacement in whole or in part. Cracked or severely damaged latch plates 114S1902-333, -334, -335, or -336 necessitates replacement with a new latch plate. (See fig. 2-27, sheet 2.)

2-99. Installation. (See fig. 2-26.)

a. Inspect the rubber seals on the forward, aft, and hinged fairings (work platforms). Have the seals replaced if necessary.

b. Position the aft fairing (3) on the helicopter aft of the forward transmission. Install screws (8) and washers at the base of the fairing.

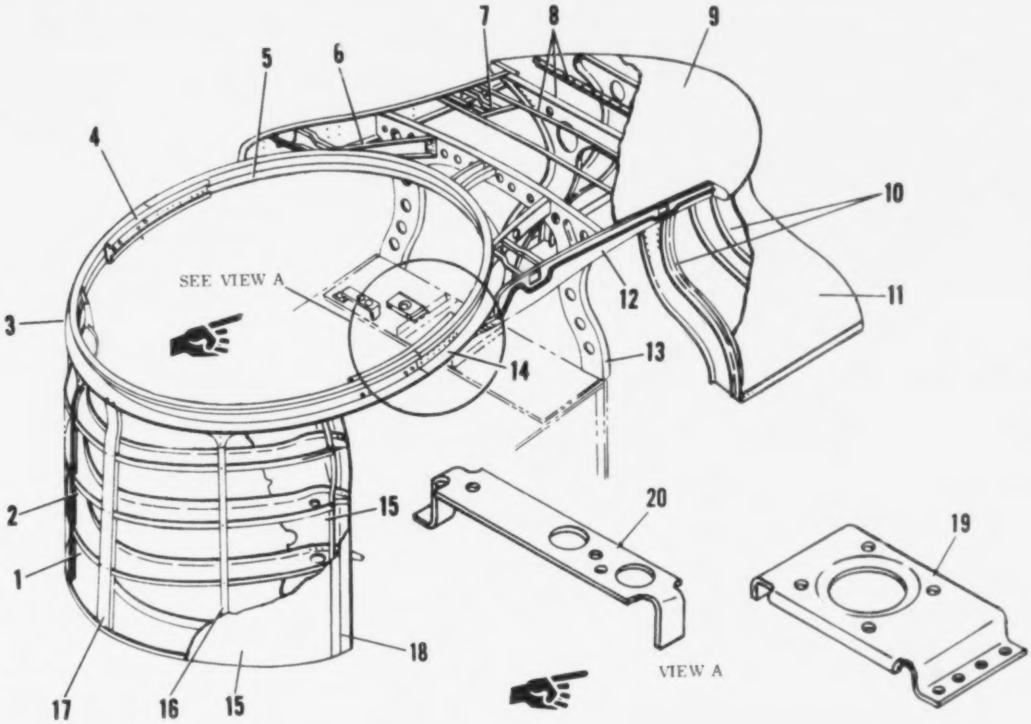

3
6
1
7
8
STA 140
STA 120
2
9
1
4
FORWARD
5

1. Screw
2. Transmission forward fairing
3. Transmission aft fairing
4. Bolt
5. Screw
6. Bolt
7. Screw
8. Screw
9. Hinged fairing (work platform)

8114-901-20T

54x39

Figure 2-26. Forward Transmission Fairing



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	FORMER	0.025 6061-T6 BARE	0.032 6061-T6 CLAD
2	FORMER	0.020 6061-T6 BARE	0.025 6061-T6 BARE
3	ANGLE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
4	SPLICE	0.080 7075-T6 BARE	0.090 7075-T6 CLAD
5	TEE	ALCOA 22981 7075-T6	0.025 4130
6	STIFFENER	0.0[illegible] 2024-T4 CLAD	0.032 2024-T3 CLAD
7	FORMER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
8	STIFFENER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
9	SKIN	2-PLY GLASS CLOTH	NOTE B.
10	FORMER	0.025 6061-T6 BARE	0.032 6061-T6 BARE
11	SKIN	3-PLY GLASS CLOTH	NOTE B.
12	CHANNEL	0.032 2024-T4 CLAD	0.032 2024-T3 CLAD
13	FORMER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
14	CHANNEL	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
15	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD
16	FORMER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
17	STIFFENER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
18	SPOILER	ALUMINUM OR GLASS	0.050 2024-T3 CLAD
19	BRACKET	0.050 2024-T3 CLAD	NOTE C.
20	BRACKET	0.050 2024-T3 CLAD	NOTE D.

A. ALL DIMENSIONS ARE IN INCHES.

B. THE SKIN IS LAMINATED POLYESTER IMPREGNATED NO. 181 GLASS CLOTH, MIL-P-8013, TYPE I, REINFORCED WITH 60 END, 830 GLASS ROVING, IMPREGNATED WITH RESIN IN ACCORDANCE WITH MIL-R-7575.

C. REPLACE WITH NEW BRACKET 114S4114-8

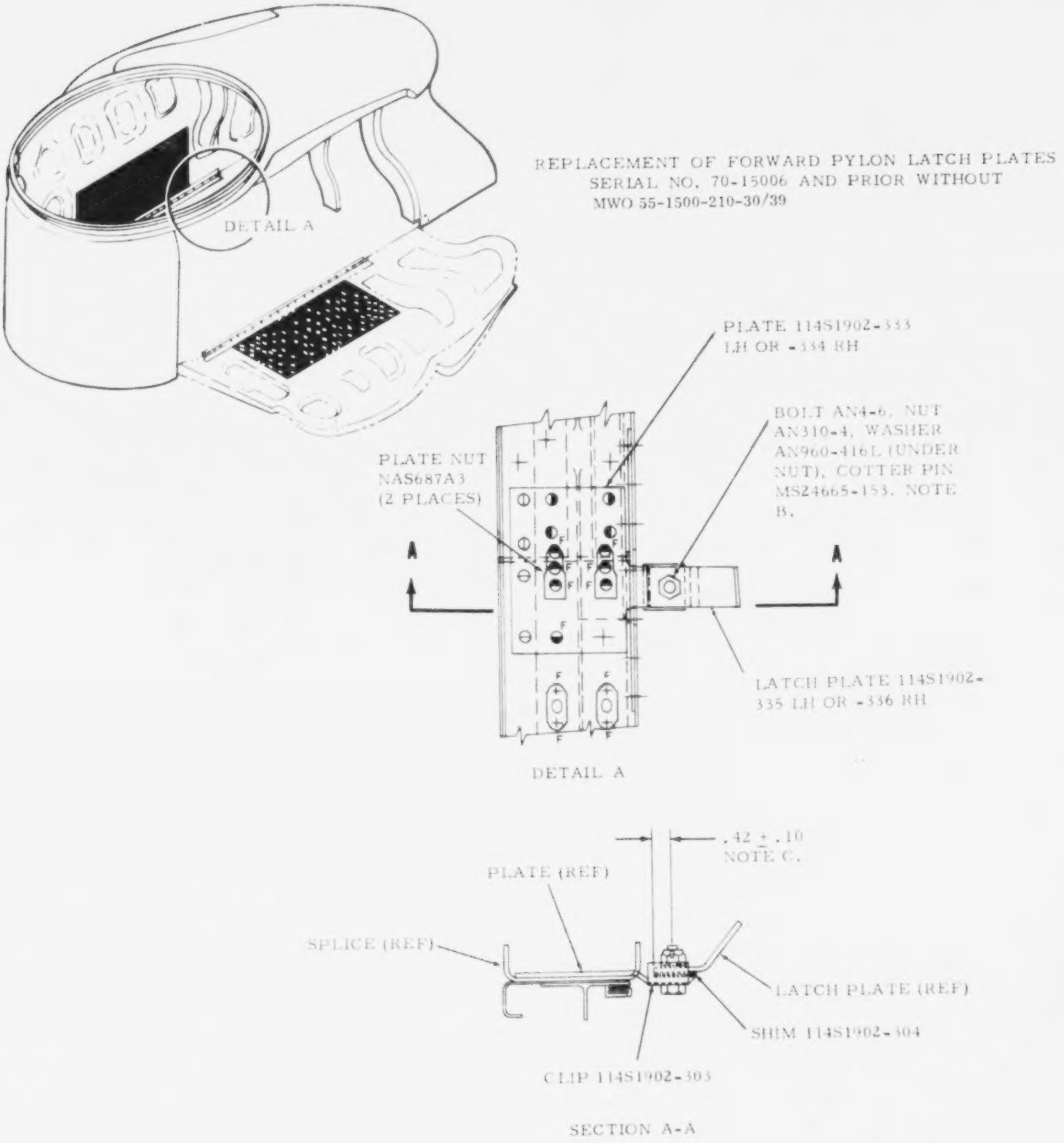
D. REPLACE WITH NEW BRACKET 114S4114-10

42x54

B114-158-345

Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 6)

REPLACEMENT OF FORWARD PYLON LATCH PLATES
SERIAL NO. 70-15006 AND PRIOR WITHOUT
MWO 55-1500-210-30/39


DETAIL A
PLATE 114S1902-333 LH OR -334 RH
BOLT AN4-6, NUT AN310-4, WASHER AN960-416L (UNDER NUT), COTTER PIN MS24665-153, NOTE B.
PLATE NUT NAS687A3 (2 PLACES)
A
A
F
LATCH PLATE 114S1902-335 LH OR -336 RH
DETAIL A
.42 ± .10 NOTE C.
PLATE (REF)
SPLICE (REF)
LATCH PLATE (REF)
SHIM 114S1902-304
CLIP 114S1902-303
SECTION A-A

RIVET LEDGEND

⦶ MS20470AD4
◑ MS20470AD5
◐ NAS1466-4 AND NAS1080-6
⊖ MS20426AD4
◓ MS20426AD3
◒ MS20426AD5

NOTES

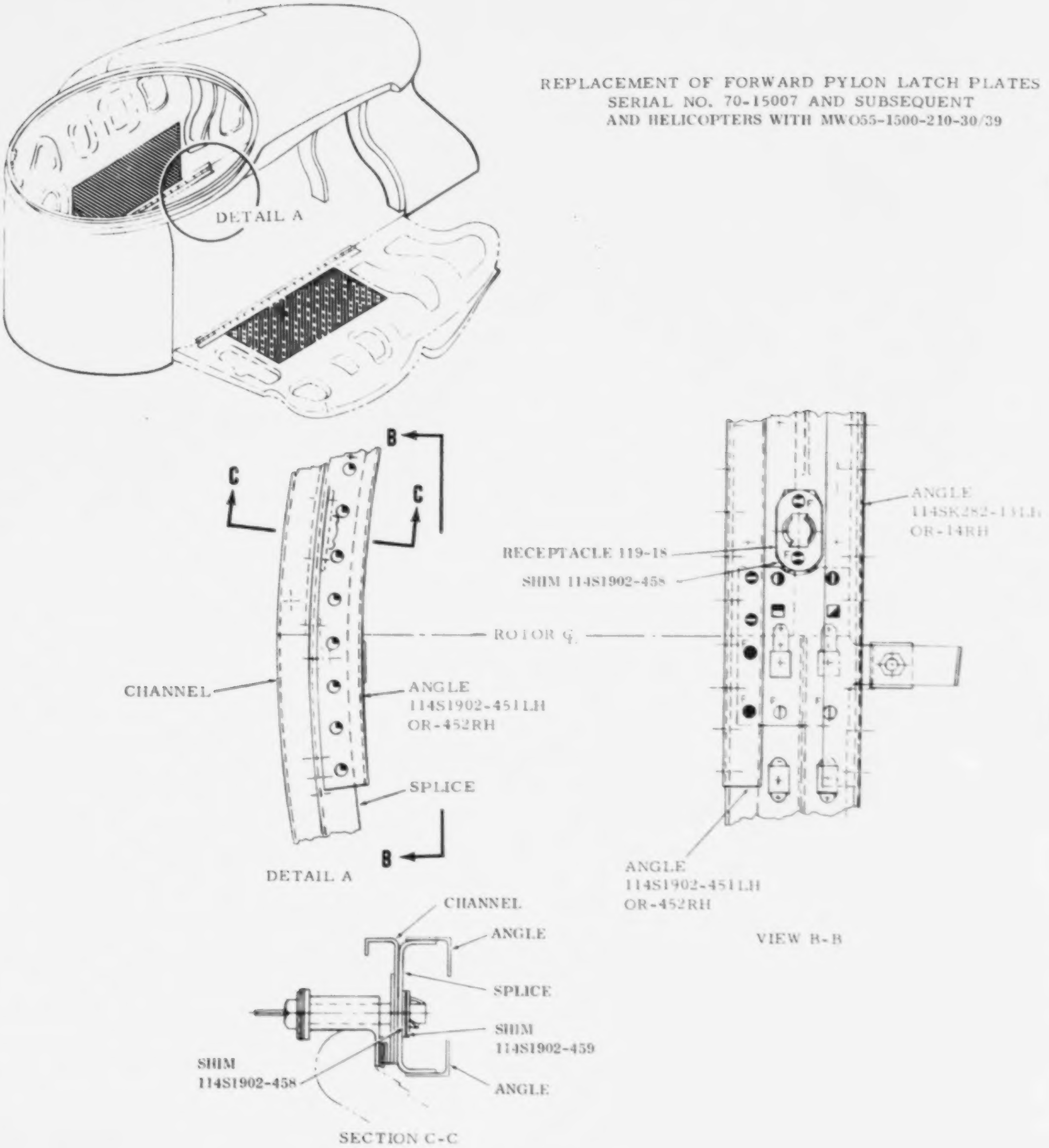
A. ALL DIMENSIONS ARE IN INCHES
B. **TORQUE NUT TO 50 TO 70 POUND INCHES** MAXIMUM OF 100 POUND INCHES IS PERMITTED FOR COTTER PIN ALIGNMENT
C. LOCATION OF LATCH PLATE TO BE ADJUSTED TO MATCH LATCH ON WORK PLATFORM

42x54

B114-372-345V

Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 6)

REPLACEMENT OF FORWARD PYLON LATCH PLATES
SERIAL NO. 70-15007 AND SUBSEQUENT
AND HELICOPTERS WITH MWO55-1500-210-30/39


DETAIL A
B
C
C
B
RECEPTACLE 119-18
SHIM 114S1902-458
ANGLE
114SK282-131LH
OR-14RH
ROTOR ℄
CHANNEL
ANGLE
114S1902-451LH
OR-452RH
SPLICE
DETAIL A
ANGLE
114S1902-451LH
OR-452RH
VIEW B-B
CHANNEL
ANGLE
SPLICE
SHIM
114S1902-459
SHIM
114S1902-458
ANGLE
SECTION C-C

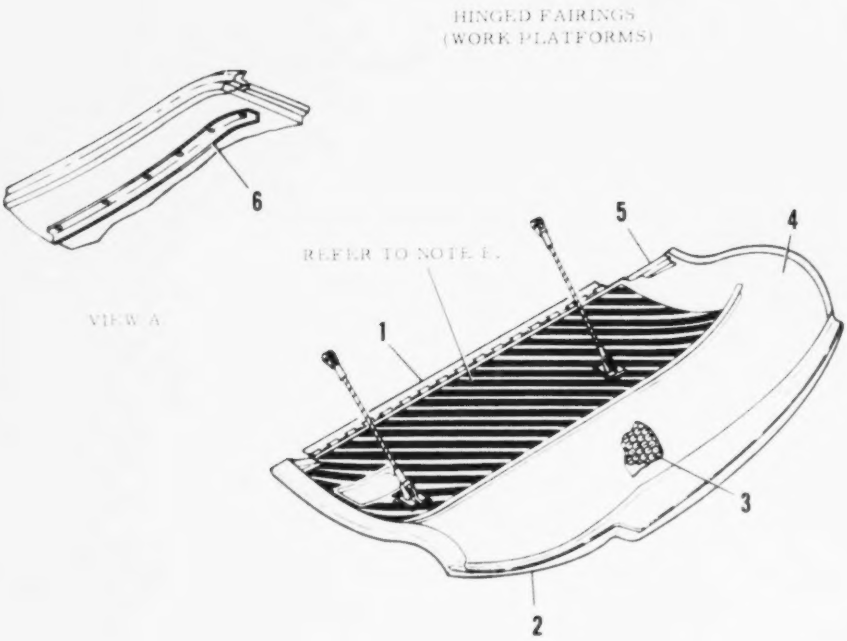
RIVET AND LOCKBOLT LEGEND

⦶	BACN15DN5AD9	RIVET	⦶	MS20470ADH	RIVET
◔	BACR15DN4AD4	RIVET	⊟	NAS1466-4	LOCKBOLT
◑	BACR15DN5AD8	RIVET	◪	NAS1466-5	LOCKBOLT
●	BACR15DP4AD6	RIVET	F○	"F" INDICATES COUNTERSINK	
⊖	BACR15DP4AD8	RIVET		HEAD ON FAR SIDE	

42x54

B114-592-34SL

Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 3 of 6)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	HINGE	MS20001PH6	NOTE C.
2	SKIN	PREIMPREGNATED GLASS FABRIC	NOTE D.
3	CORE	0.710, 5.4-3/16-20N-5052	NOTE B.
4	SKIN	PREIMPREGNATED GLASS FABRIC	NOTE D.
5	TUBE	0.75 SMLS 0.035 2024-T3	0.040 2024-T3 CLAD
6	SPOILER ANGLE	2024-T3 CLAD	NOTE F.

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE PLATFORM AREA IS OF SANDWICH HONEYCOMB CONSTRUCTION. REFER TO TM 55-1500-204-25/1

C. MACHINE TO CONFIGURATION OF ORIGINAL DAMAGED SECTION

D. LAMINATED; CONSISTING OF ONE CONTINUOUS LAYER OF BP907-120A NEXT TO THE CORE, TWO PLIES OF BP907-181A AND TWO PLIES OF BP907-120A IN THE LOWER AREA; THREE PLIES OF BP907-120A IN THE UPPER AREA; AND ONE CONTINUOUS PLY OF BP907-120A ON THE OUTSIDE OF THE LAYUP

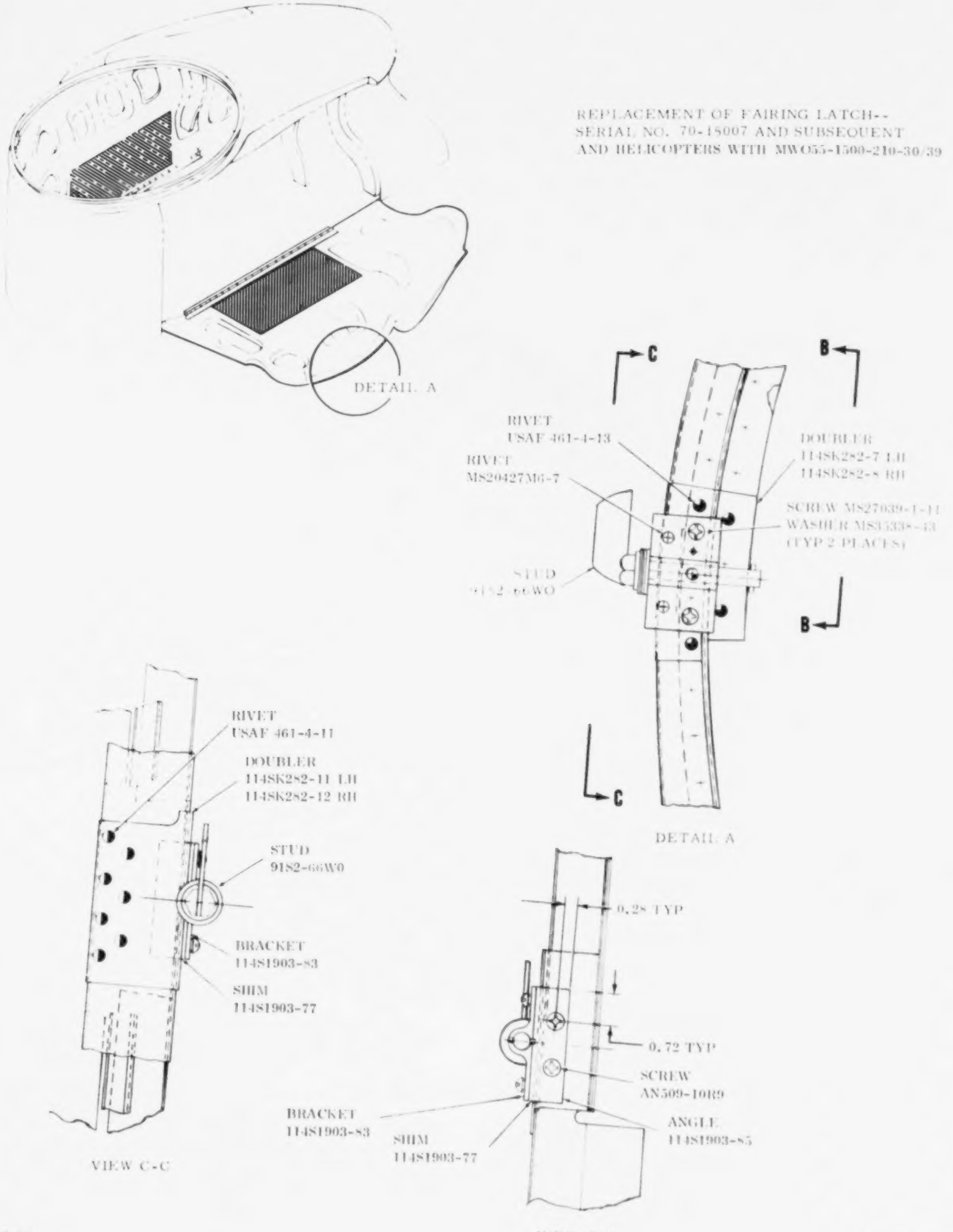
E. APPLY WALKWAY MATERIAL (C377), AS DIRECTED IN PARA 2-626, FOLLOWING REPAIRS TO THIS AREA OR AS REQUIRED BY WEAR

F. REPLACE WITH NEW SPOILER ANGLE 114S1981-3 LH OR -4 RH

42x51

B114-159-34SV

Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 4 of 6)

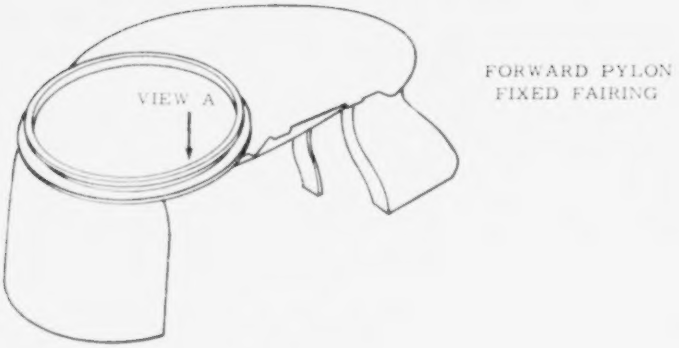


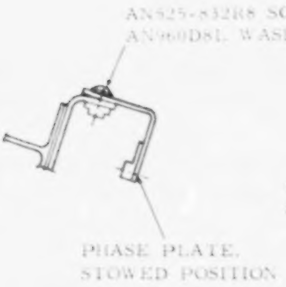
REPLACEMENT OF FAIRING LATCH--
SERIAL NO. 70-15007 AND SUBSEQUENT
AND HELICOPTERS WITH MWO55-1500-210-30/39

DETAIL A
C
B
RIVET
USAF 461-4-13
RIVET
MS20427M6-7
DOUBLER
114SK282-7 LH
114SK282-8 RH
SCREW MS27039-1-11
WASHER MS35338-43
(TYP 2 PLACES)
STUD
9182-66WO
B
C
DETAIL A
RIVET
USAF 461-4-11
DOUBLER
114SK282-11 LH
114SK282-12 RH
STUD
9182-66WO
BRACKET
114S1903-83
SHIM
114S1903-77
VIEW C-C
0.28 TYP
0.72 TYP
SCREW
AN509-10R9
BRACKET
114S1903-83
SHIM
114S1903-77
ANGLE
114S1903-85
VIEW B-B
42x54
B114-589-345L

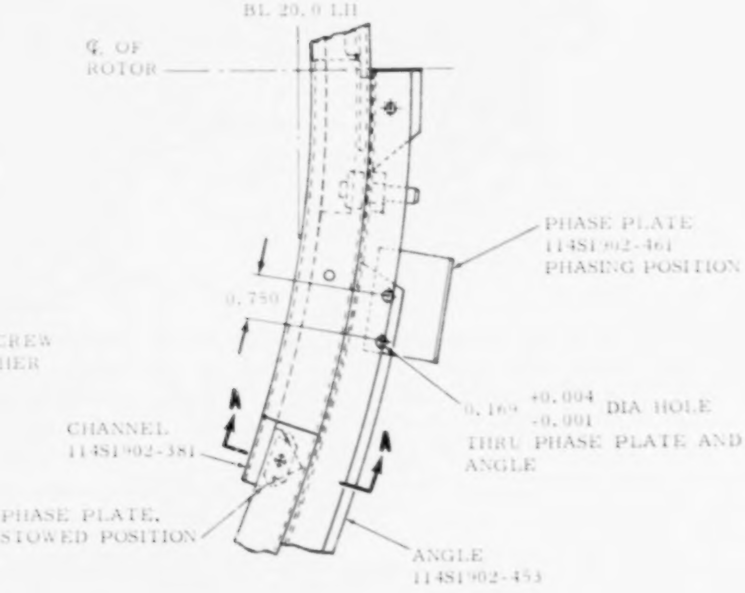
Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 5 of 6)

FAIRING REPAIR – PHASE PLATE LOCATION


VIEW A
FORWARD PYLON
FIXED FAIRING


AN525-832R8 SCREW
AN960D8L WASHER
PHASE PLATE,
STOWED POSITION

SECTION A-A


BL 20.0 LH
℄ OF
ROTOR
PHASE PLATE
114S1902-461
PHASING POSITION
0.750
A
A
0.169 +0.004 -0.001 DIA HOLE
THRU PHASE PLATE AND
ANGLE
CHANNEL
114S1902-381
PHASE PLATE,
STOWED POSITION
ANGLE
114S1902-453

VIEW A

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. POSITION ONE OF THE THREE CLEVISES ON THE ROTATING RING OF THE CONTROLLABLE SWASHPLATE (ATTACHMENT FOR THE LOWER END OF PITCH LINK) SO THAT IT IS CENTERED DIRECTLY OVER THE CLEVIS ON THE STATIONARY RING (ATTACHMENT FOR THE SWIVELING ACTUATOR). THIS WILL POSITION THE PHASING RIVET ON THE RAINSHIELD WITH RESPECT TO THE LOCATION OF THE POINTED END OF THE PHASE PLATE. PLACE THE PHASE PLATE ON THE ANGLE 114S1902-453 AND LOCATE THE ATTACHING HOLES

42x54

Figure 2-27. Forward Pylon Structure and Fairing Repairs—Cockpit Fuselage Structure Assembly (Sheet 6 of 6)

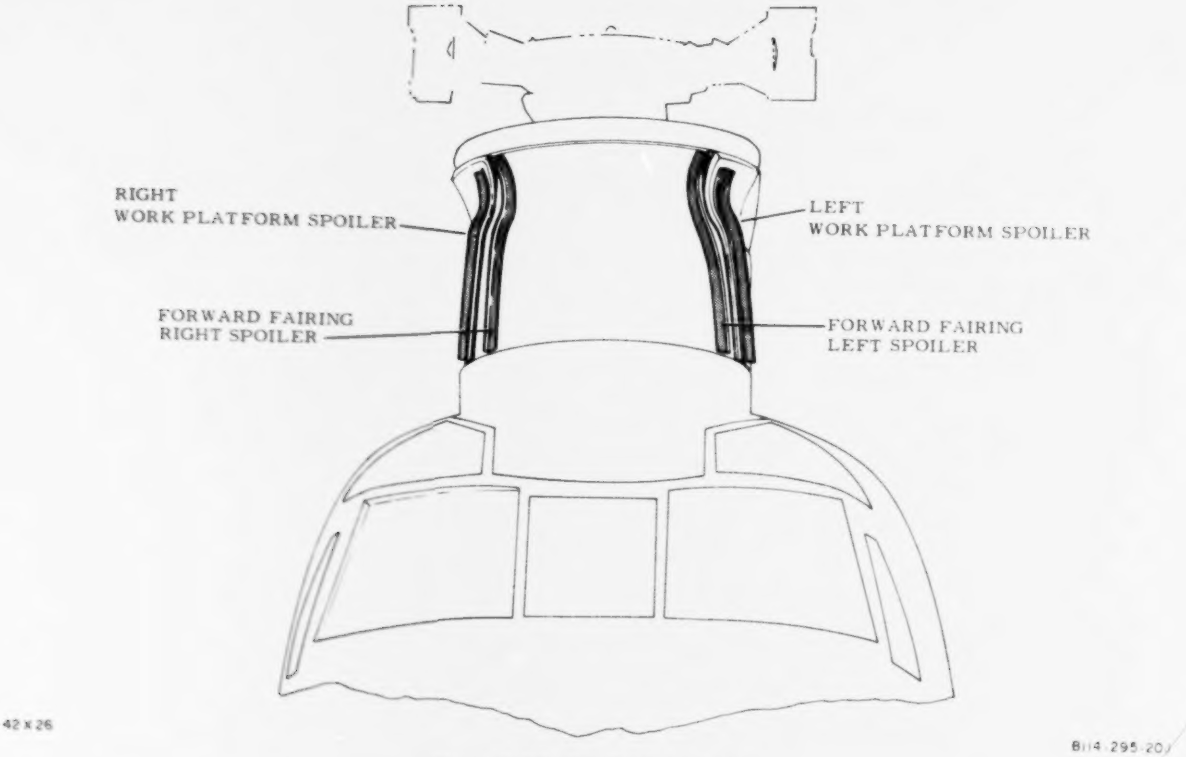


Figure 2-28. Spoiler Installation

c. Secure the aft fairing to the bracket at sta 140. Use screws (7) and washers.

d. Secure the aft fairing to the transmission mounting structure at sta 120. Use bolts (6) and washers.

e. Connect the oil indicator light electrical connector.

f. Position the forward fairing (2) forward of the hinged fairings. Install screws (5) and washers at the base of the fairings.

g. Secure the forward fairing to the aft fairing (3) at the center of the ring. Use screws (1) and washers.

h. Secure the forward fairing to the transmission mounting structure. Use bolts (4) and washers.

WARNING

> Make sure area is clear of foreign objects before closing fairings. If the area is not cleared, damage to components and systems could result in personal injury or death.

i. Close the left and right hinged fairings.

2-100. Spoilers. (See fig. 2-28.)

Right and left spoilers are installed on the forward transmission fairing just forward of the work platform leading edge. One spoiler is installed on each of the forward work platforms, just aft of the platform leading edge. The spoilers are fabricated of either aluminum alloy or fiberglass. The spoilers are vertically mounted, are approximately 1 inch high, and are externally fastened by rivets. The spoilers improve flight stability.

2-101. Inspection. Check for damage and for loose rivets.

2-102. Repair (AVIM). Refer to fig. 2-27 for fairing repairs. Damage to formed parts affecting more than half the widest flange or extending into the radius should be repaired by insertion.

2-103. Replacement. Extensive damage, such as loss of a major portion of the spoiler or numerous isolated damages necessitates replacement.

2-104. Forward Pylon Hinged Fairing.

(See fig. 2-29.) A work platform is installed on each side of the forward transmission fairing. When the work platforms are open, maintenance can easily be performed on the rotor and drive system components. The platform has a rigidized tread sheet, a core of aluminum honeycomb, and fittings for attachment of cable assemblies. The tread sheet is coated with walkway material. See fig. 2-27. The fairing consists of an inner and outer skin made of laminated, plastic-impregnated glass cloth except in the platform area which is sandwich honeycomb construction. The skins are stiffened with formed sections.

2-105. Inspection. (See fig. 2-29.) Inspect for the following conditions:

a. Rubber seals on work platforms for damage or deterioration. Replace them if necessary.

b. Platforms for cracks and other obvious damage.

c. Cables (6) for fraying corrosion, and security at each end

d. Latches (11 and 12) for security, damage, and positive latching.

*2-106. **Removal**.* (See fig. 2-29.)

a. Disconnect bonding jumpers (1).

b. Remove cotter pin (2), nut (3), washers (4), and bolt (5) connecting cable assemblies (6) to the work platform (7) at both ends.

c. Remove screw (9) and hinge clip (8) securing the hinge pin (10).

d. Remove hinge pin (10) and the work platform (7).

*2-107. **Repair**.* See fig. 2-27 for forward pylon hinged fairing repair.

a. Damage to metal parts not affecting a radius can be repaired by patching.

b. (AVIM). Damage to metal parts, affecting a radius should be repaired by insertion.

*2-108. **Installation**.* (See fig. 2-29.)

a. Position the work platform (7) on the pylon. Insert hinge pin (10). Install hinge clip (8) with screw (9).

b. Connect the cable assemblies (6) at each end of the work platform. Install bolt (5), washer (4) (under the bolthead and at each end of the lug), nut (3) with washer (4) (under the nut). Install the cotter pin (2).

c. Connect bonding jumpers (1).

*2-109. **Nose Compartment Door**.*

See fig. 2-30. The nose compartment door consists of a spotwelded assembly, a hinge, a latch assy, a strut, and aluminum angles. The spotwelded assembly, made entirely of aluminum alloy, is an outer skin to which is spotwelded an inner pan.

*2-110. **Inspection**.* Check that burnished nicks, scratches, and dents do not interfere with operation of the door.

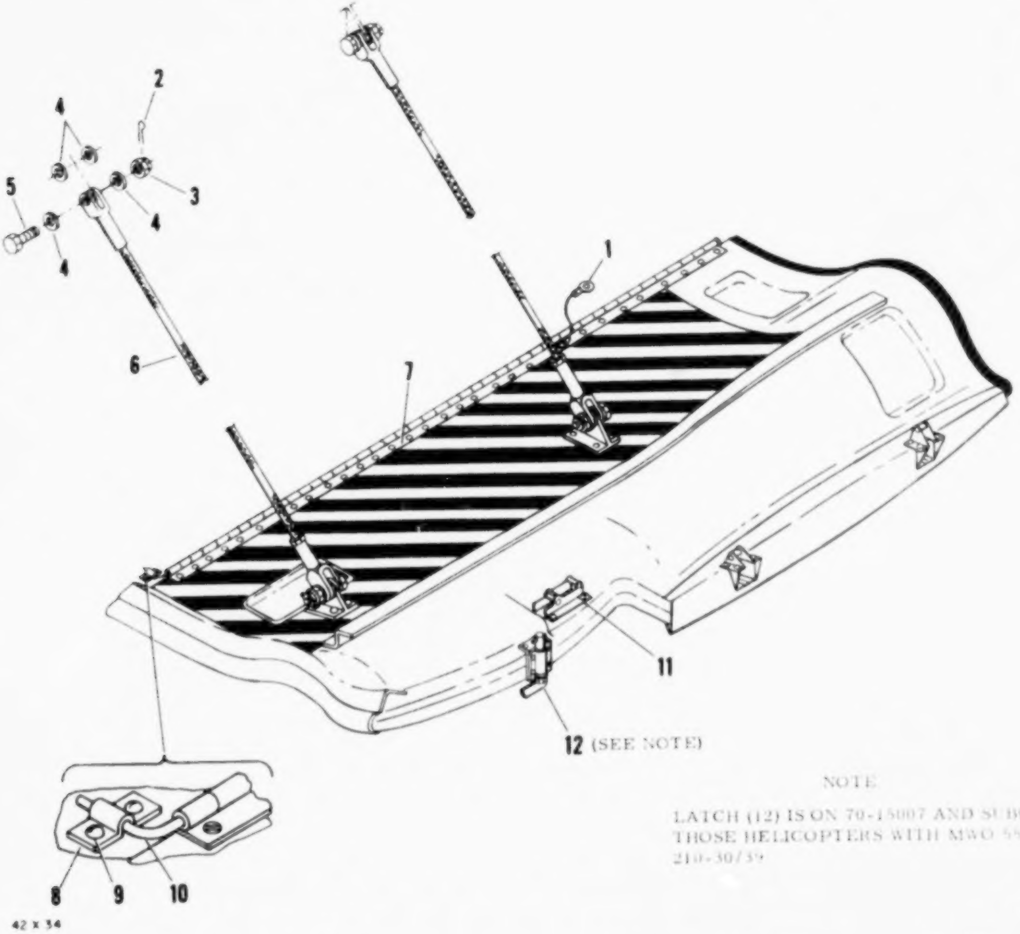
*2-111. **Removal**.* (See fig. 2-31.)

a. Open nose compartment access door (19).

b. Disconnect strap (3) from the door.

c. Disconnect bonding jumper (20) from the nose structure.

d. Remove door (19) by removing screws (4) and washers (5) or by pulling hinge pin.

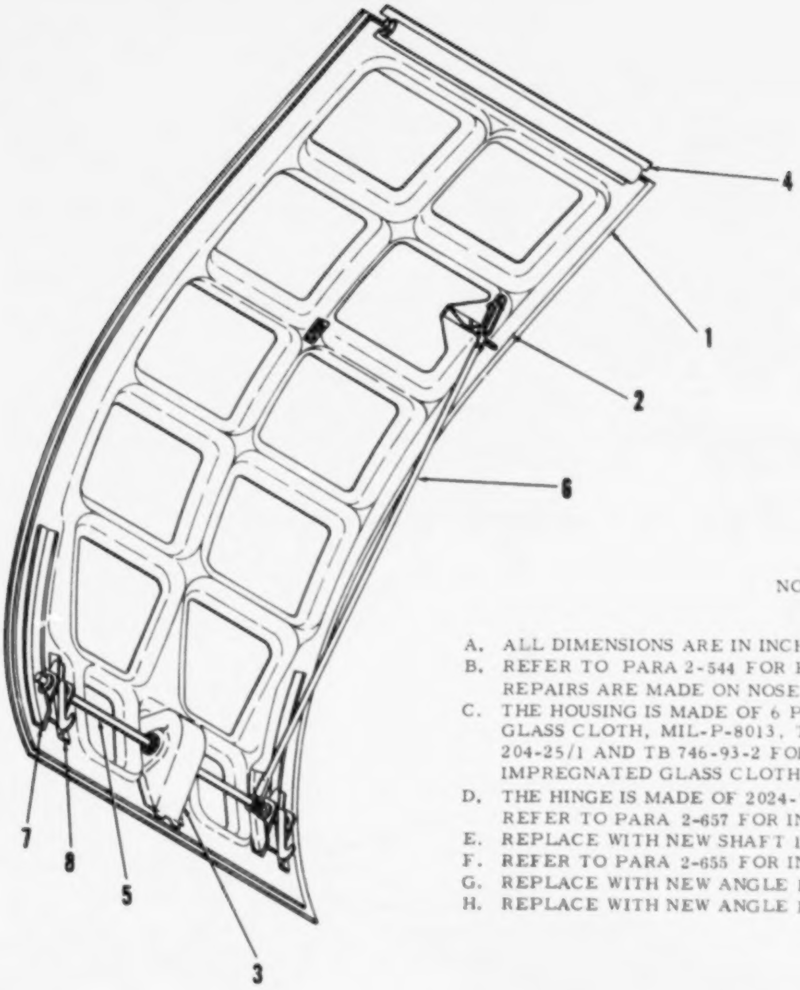


NOTE

LATCH (12) IS ON 70-15007 AND SUBQ AND THOSE HELICOPTERS WITH MWO 55-1520-210-30/39

1. Bonding jumper
2. Cotter pin
3. Nut
4. Washer
5. Bolt
6. Cable assembly
7. Fairing (work platform)
8. Hinge clip
9. Screw
10. Hinge pin
11. Latch
12. Camloc latch

Figure 2-29. Forward Work Platform Installation



NOTES

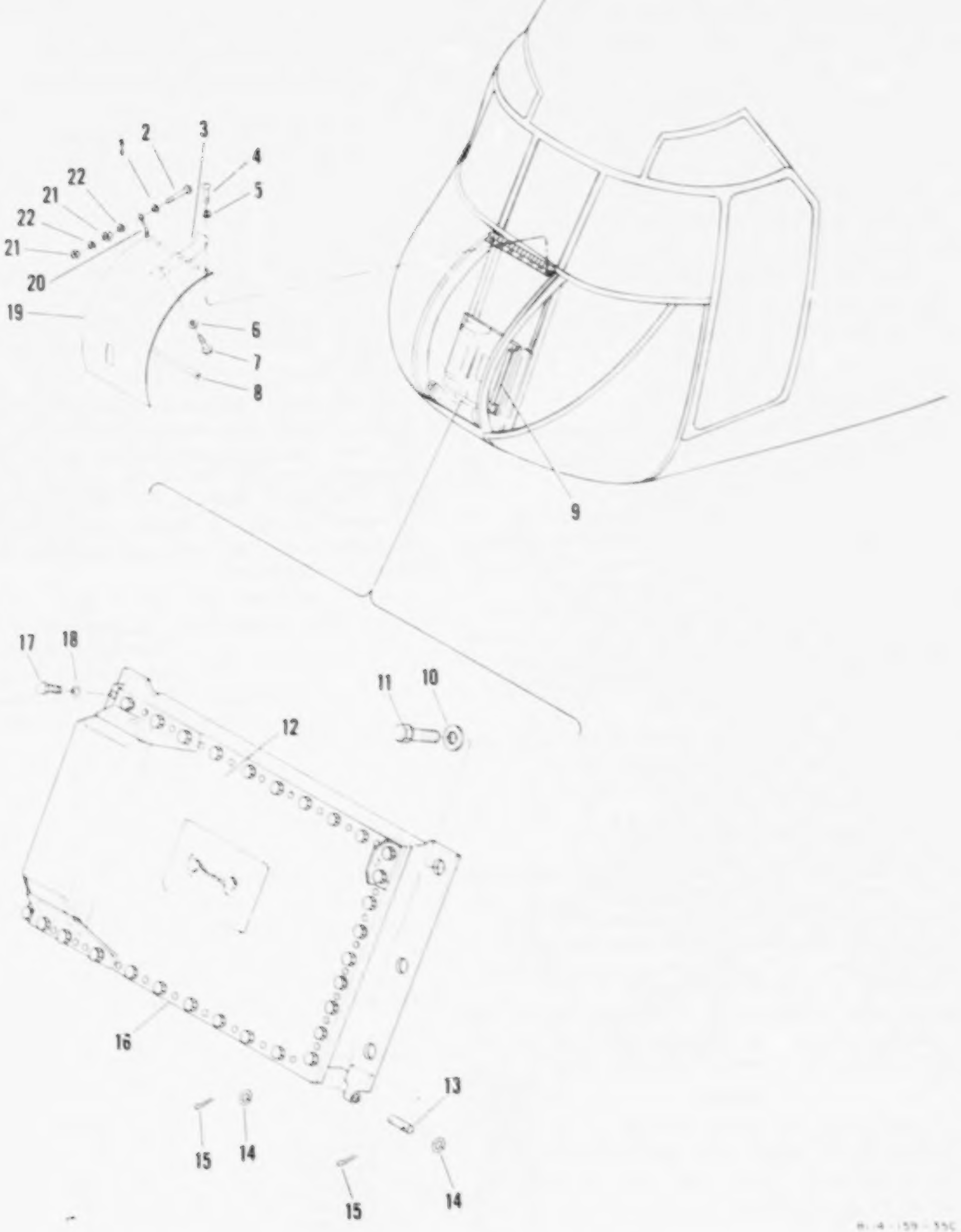
A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO PARA 2-544 FOR FUSELAGE SEALING WHEN REPAIRS ARE MADE ON NOSE COMPARTMENT DOOR ASSY
C. THE HOUSING IS MADE OF 6 PLYS OF 181 IMPREGNATED GLASS CLOTH, MIL-P-8013, TYPE I. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR INFORMATION ON REPAIR OF IMPREGNATED GLASS CLOTH STRUCTURES
D. THE HINGE IS MADE OF 2024-T4 ALUMINUM ALLOY EXTRUSION REFER TO PARA 2-657 FOR INFORMATION ON REPAIR OF HINGES
E. REPLACE WITH NEW SHAFT 114S1632-35
F. REFER TO PARA 2-655 FOR INFORMATION ON TUBE REPAIR
G. REPLACE WITH NEW ANGLE 114S1632-17 LH OR -18 RH
H. REPLACE WITH NEW ANGLE 114S1632-19 LH OR -20 RH

INDEX	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN--OUTER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
2	SKIN--INNER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
3	HOUSING	NOTE C.	--
4	HINGE	NOTE D.	--
5	SHAFT	0.31 SQ ROLLED BAR 2024-T4	NOTE E.
6	STRUT	0.50 SMLS TUBE 0.035 6061-T6	NOTE F.
7	ANGLE	0.032 2024-T4 CLAD	NOTE G.
8	ANGLE	0.032 2024-T4 CLAD	NOTE H.

42x54

B114-605-34SV

Figure 2-30. Nose Compartment Door Assy Repairs—Cockpit Fuselage Structure Assy


1
2
3
4
5
22
21
22
21
20
19
6
7
8
9
17
18
11
10
12
16
13
15
14
15
14
B-4-159-55C

1. Split washer
2. Screw
3. Strap
4. Screw
5. Washer
6. Washer
7. Screw
8. Brace
9. Fabricated handle
10. Washer
11. Bolt
12. Absorber cover
13. Hinge pin
14. Washer
15. Cotter pin
16. Nose absorber
17. Bolt
18. Washer
19. Nose compartment access door
20. Bonding jumper
21. Nut
22. Washer

Figure 2-31. Nose Door and Dynamic Absorber Installation, CH-47B

2-112. *Repair.* (See fig. 2-30.)

a. Holes and stop-drilled cracks, not exceeding the limits shown in fig. 2-6, can be repaired by patching. The patching may not effect the edges of the nose compartment door. See fig. 2-7 for examples of typical repairs to the outer skin and inner pan.

b. (AVIM). Refer to TM 55-1500-204-25/1 for information on spotwelding the inner pan.

2-113. *Installation.* (See fig. 2-31.) Install nose compartment door (19) as follows:

a. Position door and install the door hinge pin or screws (4) and washers (5).

b. Connect bonding jumper (20) to the nose structure.

c. Connect strap (3) to the door.

d. Close nose compartment access door (19).

2-114. *Cabin Door.*

(See fig. 2-32.) The cabin door consists of an upper and a lower door assembly. The upper and lower doors open independently of each other.

a. The upper door rolls upward on tracks (2,3, and 15) attached to the cabin structure. The door is held open by a latch (1) attached to the forward upper track (2). An upper cabin door descent delay mechanism is installed on the aft track assembly (15). The descent delay prevents possible injury to personnel if the upper door latch is accidentally released. The upper door (5) contains an escape hatch (6) which, in turn, contains a window (7). (Refer to para 2-122.)

b. The lower door (9) opens outward and downward against a beam hinge and stop (11). It contains an integral step (13) to facilitate entrance to and exit from the helicopter. A handle is provided for retracting the lower door section from inside the helicopter.

c. The upper door assembly consists of outer aluminum alloy skins, inner aluminum alloy pans, a stretched acrylic plastic window pane, rubber seals, and rubber-fabric seal fillers. Each outer skin is spotwelded to an inner pan, forming an upper door unit and an escape hatch. The lower door assembly consists of spotwelded inner and outer aluminum alloy skins, a step of sandwich honeycomb construction, a rubber seal, an aluminum alloy Zee, and aluminum alloy gussets and angles (See fig. 2-33.)

NOTE

On helicopters with MWO 55-1500-204-30-1, a locking device consisting of a steel bracket and a padlock is used to secure the upper and lower halves of the cabin door.

2-115. *Inspection of Cabin Door.* Inspect for the following conditions:

a. Tracks and track bearings for roughness, evidence of wear, corrosion, misalignment, and security.

b. Seals for deterioration.

c. Descent delay mechanism for condition.

d. Hold-open-latch for security and condition.

2-116. *Removal.* (See fig. 2-32.)

a. Remove the upper cabin door (5) as follows:

(1) Remove the bolt which secures the latch (1) to the top of the forward upper track (2).

(2) Remove the latch (1) and spring.

(3) Remove the flathead pin and rubber bumper from the track.

(4) Slide the door up and off the tracks.

b. Remove the lower cabin door (9) as follows:

(1) Open the door and support it in this position.

(2) Remove the two bolts which secure the two beam hinges (11) to the fuselage fittings.

(3) Remove the bonding wire from the forward attaching beam support mount bolts.

(4) Remove the bolts, nuts, and washers which hinge the lower door to the fuselage and remove the door.

2-117. *Repair.* (See fig. 2-33.)

a. Burnished nicks, scratches, and dents are permissible if the burnished area does not interfere with operation of the door. Holes and stop-drilled cracks, not exceeding limits shown in fig. 2-6, can be temporarily patched. See fig. 2-7, sheet 7. Refer to TM 55-1500-204-25/1 for information on repair of window pane. Damage exceeding negligible limits can be repaired by patching if the door edges are not affected.

b. (AVIM). For examples of typical repairs to the sandwich honeycomb step, inner and outer skins, and spotwelding, refer to TM 55-1500-204-25/1. Apply walkway material (C377) to upper portion of step, if repairs occur i that area. Refer to para 2-626. Cracks in gussets or angles at the forward and aft ends of lower cabin door step can be repaired as follows:

(1) Fabricate two angles from AND10134-1204, 2024T3 aluminum extrusion.

(2) Remove step assembly.

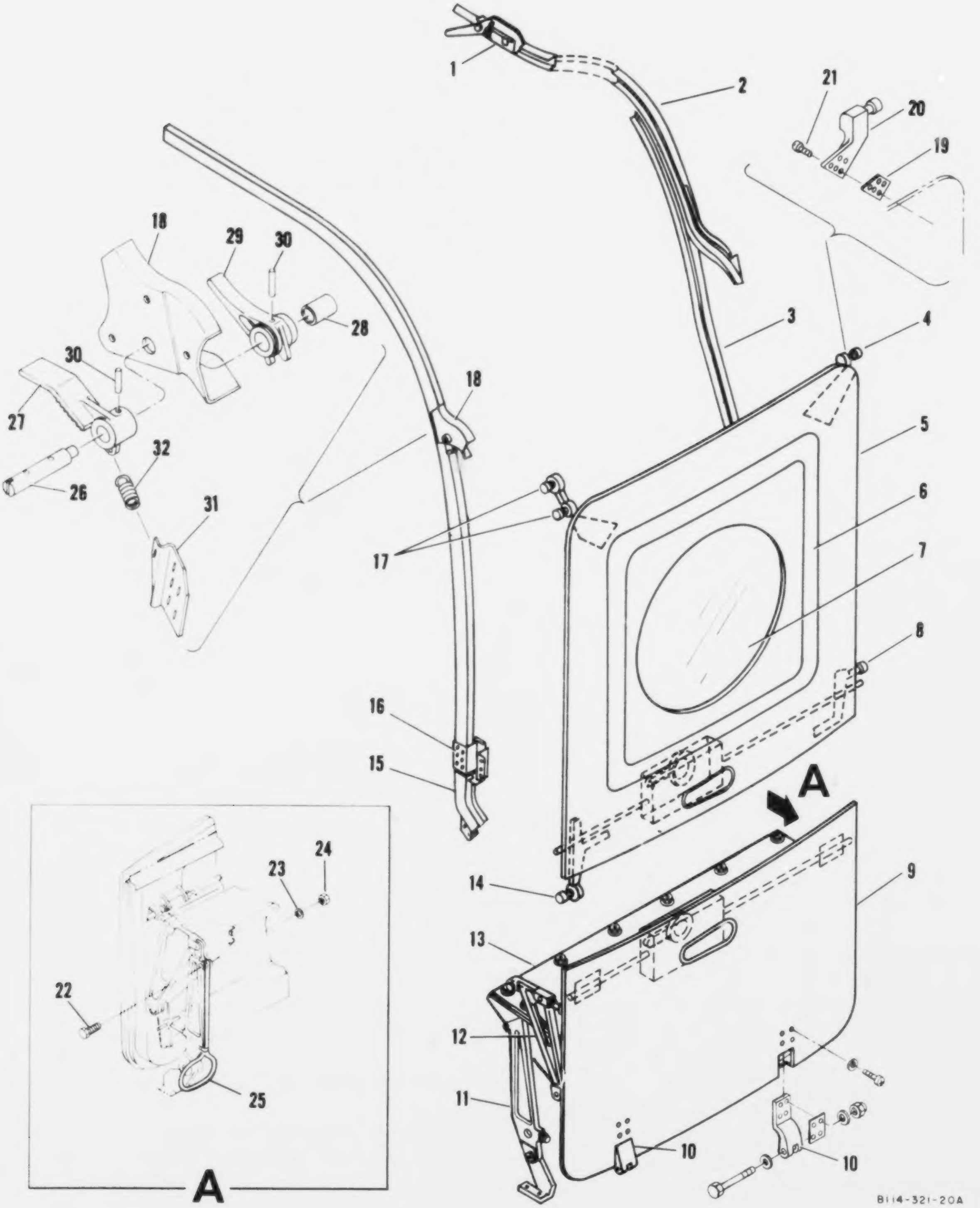
(3) Remove rivets from side and bottom of gussets and angles.

(4) Position new angles as shown in fig. 2-33, sheet 3, and using existing rivet holes as a pattern, drill the new angles.

(5) Remove angles, deburr rivet holes, and finish angles as directed in para 2-618.

Legend for figure 2-32

1. Latch
2. Forward upper track
3. Forward lower track
4. Forward upper roller
5. Upper cabin door
6. Escape hatch
7. Window
8. Forward lower roller
9. Lower cabin door
10. Hinge fittings
11. Beam hinge and stop
12. Lock hinge attachment
13. Step
14. Aft lower roller
15. Aft track
16. Bracket and keeper
17. Aft upper rollers
18. Track
19. Shim
20. Support
21. Screw
22. Screw
23. Washer
24. Nut
25. Handle
26. Pin
27. Lever
28. Bearing
29. Guide
30. Pin
31. Clip
32. Spring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B114-321-20A

Figure 2-32. Cabin Door

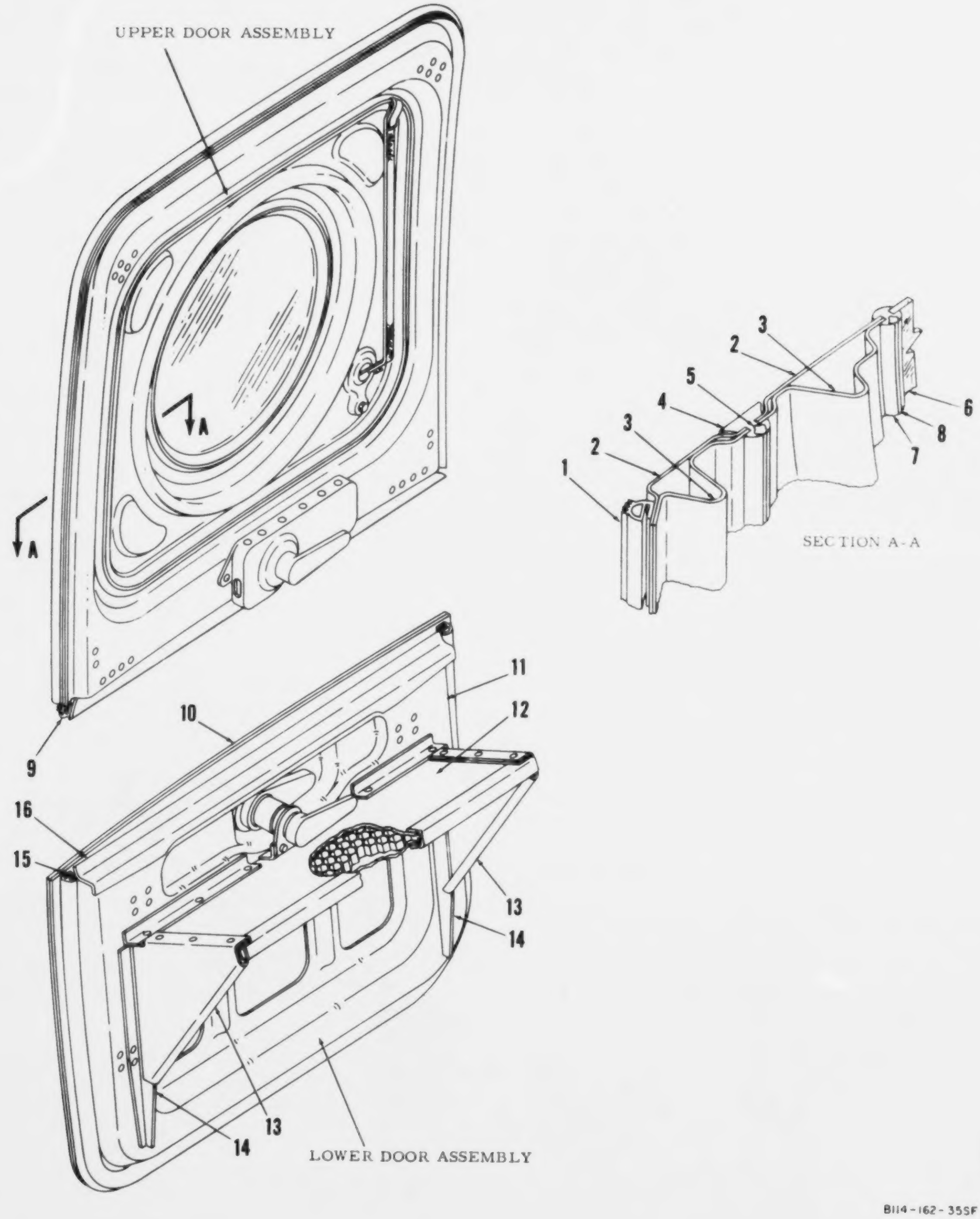

UPPER DOOR ASSEMBLY
A
A
3
2
5
4
3
2
1
6
8
7
SECTION A-A
11
10
12
9
16
15
13
14
13
14
LOWER DOOR ASSEMBLY
B114-162-35SF

Figure 2-33. Cabin Door Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 3)

UPPER DOOR

INDEX	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SEAL	NOTE B.	--
2	OUTER SKIN	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
3	INNER PAN	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
4	SEAL	NOTE C.	--
5	SEAL FILLER	NOTE D.	--
6	PANE	NOTE E.	--
7	SEAL	NOTE F.	--
8	SEAL FILLER	NOTE G.	--
9	SEAL	NOTE H.	--

LOWER DOOR

INDEX	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
10	OUTER SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD
11	INNER SKIN	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
12	STEP	NOTE I.	--
13	GUSSET	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
14	ANGLE	ALCOA 22509 7075-T6	--
15	SEAL	NOTE J.	--
16	ZEE	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW SEAL 114S1621-9
C. REPLACE WITH NEW SEAL 114S1621-5
D. REPLACE WITH NEW SEAL FILLER 114S1621-7
E. THE WINDOW PANE IS MADE OF 0.080-THICK ACRYLIC SHEET, MIL-P-25690
F. REPLACE WITH NEW SEAL 114S2901-16
G. REPLACE WITH NEW SEAL FILLER 114S2901-15
H. REPLACE WITH NEW SEAL 114S1621-11
I. THE STEP ASSEMBLY IS A SANDWICH HONEYCOMB STRUCTURE. THE TOP SKIN IS 0.032 2024-T4 CLAD ALUMINUM ALLOY. THE CORE IS 0.540, 4.3-1/4-20NP-3003 ALUMINUM HONEYCOMB. THE BOTTOM SKIN IS 0.016 7075-T6 CLAD ALUMINUM ALLOY. REFER TO TM 55-1500-204-25/1 FOR INFORMATION ON REPAIR OF SANDWICH HONEYCOMB STRUCTURES
J. REPLACE WITH NEW SEAL 114S1620-43

42x30

B114 163 34SV

Figure 2-33. Cabin Door Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 3)

(6) Install parts and rivet in place. Use rivets MS-20426AD4 on bottom and rivets MS20470AD4 on sides.

(7) Fabricate a step pad from ⅝-inch-thick marine quality plywood, and finish both sides of step pad with gray enamel (C140.1), color 36231. After enamel has dried, cover the top of step pad with type II walkway material (C377). Refer to para 2-626.

(8) Trim edge of gussets as shown in fig. 2-33, sheet 3.

(9) Reinstall step assembly and plywood step pad.

2-118. Replacement of Cabin Door Hinge Fittings. (See fig. 2-32.)

a. Open the door slightly. Support the door in this position.

b. Remove the bolt, nut, and washer from the hinges.

c. Remove the four screws and four washers which secure the hinge to the door.

d. Insert the new hinge into the opening and loosely install the four screws and washers.

e. Align the holes of the hinge fittings, and insert the bolt, nut, and washer.

f. Tighten the four screws of the hinge.

g. Seal the opening around the hinge in the door. Use sealer (C296).

h. Close and lock the door.

2-119. Replacement of Cabin Door Track. (See fig. 2-32.)

a. Remove the upper cabin door from the track. (Refer to para 2-116.)

b. Remove the screws from within the track and remove the track.

c. Position the replacement track in its proper location. Install the screws and spacers.

d. Install the upper door into the track. (Refer to para 2-120.)

2-120. Installation. (See fig. 2-32.)

a. Install the upper cabin door as follows:

(1) Insert the lower rollers (8 and 14) of the upper cabin door into the upper end of the forward and aft tracks.

(2) Raise the spring-operated lever (27) on the aft track. Guide the upper rollers (4 and 17) onto the tracks. At the same time, pass the aft lower roller (14) beneath the lever-operated guide (29).

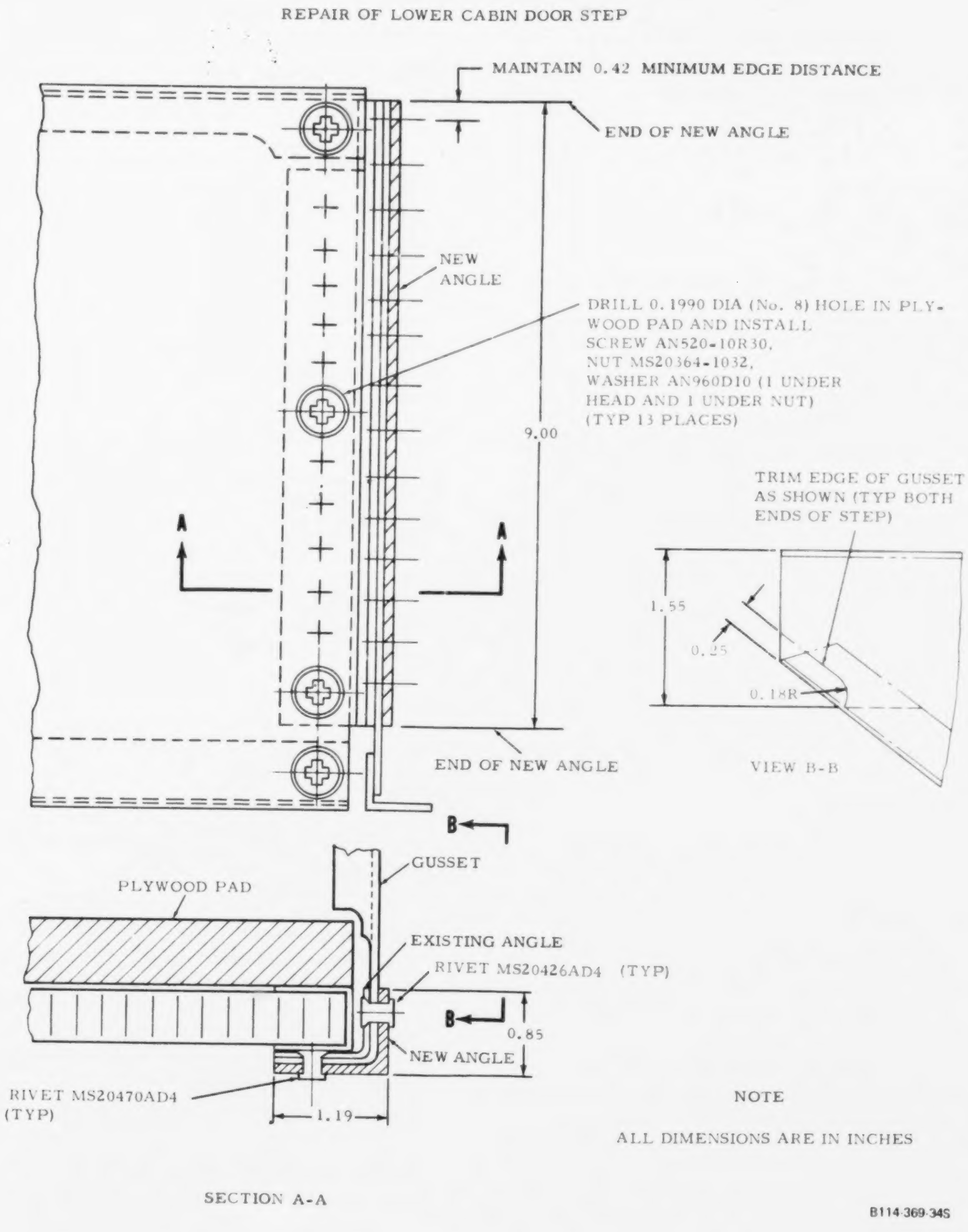

REPAIR OF LOWER CABIN DOOR STEP
MAINTAIN 0.42 MINIMUM EDGE DISTANCE
END OF NEW ANGLE
NEW ANGLE
DRILL 0.1990 DIA (No. 8) HOLE IN PLYWOOD PAD AND INSTALL SCREW AN520-10R30, NUT MS20364-1032, WASHER AN960D10 (1 UNDER HEAD AND 1 UNDER NUT) (TYP 13 PLACES)
9.00
A
A
END OF NEW ANGLE
TRIM EDGE OF GUSSET AS SHOWN (TYP BOTH ENDS OF STEP)
1.55
0.25
0.18R
VIEW B-B
B
GUSSET
PLYWOOD PAD
EXISTING ANGLE
RIVET MS20426AD4 (TYP)
B
0.85
NEW ANGLE
RIVET MS20470AD4 (TYP)
1.19
NOTE
ALL DIMENSIONS ARE IN INCHES
42x48
SECTION A-A
B114-369-34S

Figure 2-33. Cabin Door Repairs—Cockpit Fuselage Structure Assembly (Sheet 3 of 3)

(3) Release the lever to allow the guide to return to its normal position.

(4) Close the door assembly.

(5) Install the rubber bumper and flathead pin in the track.

(6) Install the latch and spring.

(7) Check the door sealing qualities when closed and latched. Adjust the door if necessar (Refer to para 2-121.)

(8) Check the operation of the door for freedom of movement on the tracks when the door is opened. Check to be sure that the door is latched in the open position.

CAUTION

To prevent damage to the door and coaming, do not leave the handle of the upper door extended.

b. Install the lower cabin door as follows:

(1) Align the two hinge fittings (10) with the fittings on the fuselage. Install the attaching bolts, nuts, and washers.

(2) Install the two bolts which secure the two beam hinges (11) to the fuselage fittings.

(3) Adjust the length of the two door lock fittings (See fig. 2-34) so that the lower door can be closed tightly and locked.

(4) Adjust the down stops on the beam hinges so that when the door is lowered, the stops will contact the fuselage fittings simultaneously and the door will clear the fuselage.

2-121. Adjustment of Upper Cabin Door. (See fig 2-32.)

a. Remove the upper cabin door (5). (Refer to para 2-116, step a.)

b. Remove the screws (21) and the support (20), or all four supports if necessary, from the upper cabin door.

c. Add laminated shim (19) peeled to the thickness required, to obtain a suitable fit between the upper cabin door and the mating structure when in the closed position.

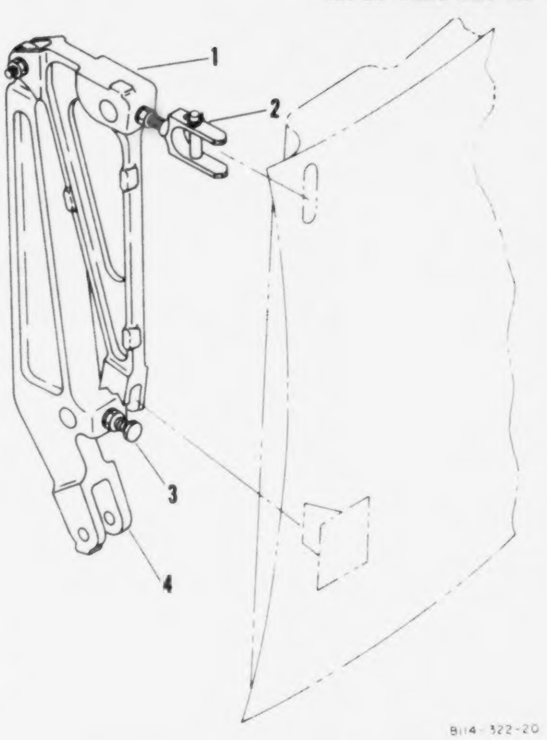
d. Locate and drill the required amount of 0.25-inch-diameter screw holes in the shim (19).

e. Secure the shim (19) and the support (20) to the upper cabin door with the screws (21).

f. Install the upper cabin door (5). (Refer to para 2-120, step a.)

2-122. Forward Escape Hatches.

(See fig. 2-33.) Two escape hatches are located in the forward cabin section. One is in the upper cabin door. One is in the left side of the cabin directly across from the cabin door. The escape hatch consists of a spotwelded assembly, a window pane, seals, and seal fillers. The spotwelded assembly, made entirely of aluminum alloy, is an outer skin to which is spotwelded an inner pan and a doubler. The window pane is made of stretched acrylic plastic. The window pane is retained in the escape hatch, and escape hatch is retained in the fuselage structure by rubber seals, and rubber-fabric seal fillers. A release strap can be pulled from either inside or outside of the cabin. A luminous marker is installed on each escape hatch.



1. Hinge link
2. Rod end link
3. Down stop bolt
4. Beam hinge and stop

Figure 2-34. Lower Cabin Door Adjustment

NOTE

On helicopters with MWO55-1500-204-30-1, a phenolic clamp acts as a locking device for each escape hatch.

2-123. Inspection of Forward Cabin Escape Hatch. (See fig. 2-35.) Inspect for the following conditions:

a. Seal and hatch retainer (4) for condition and security.

b. Condition and security of release strap (2) and grommet (5).

c. Luminous marker (6) below hatch for damage.

d. Bonding jumper (7) for security and fraying.

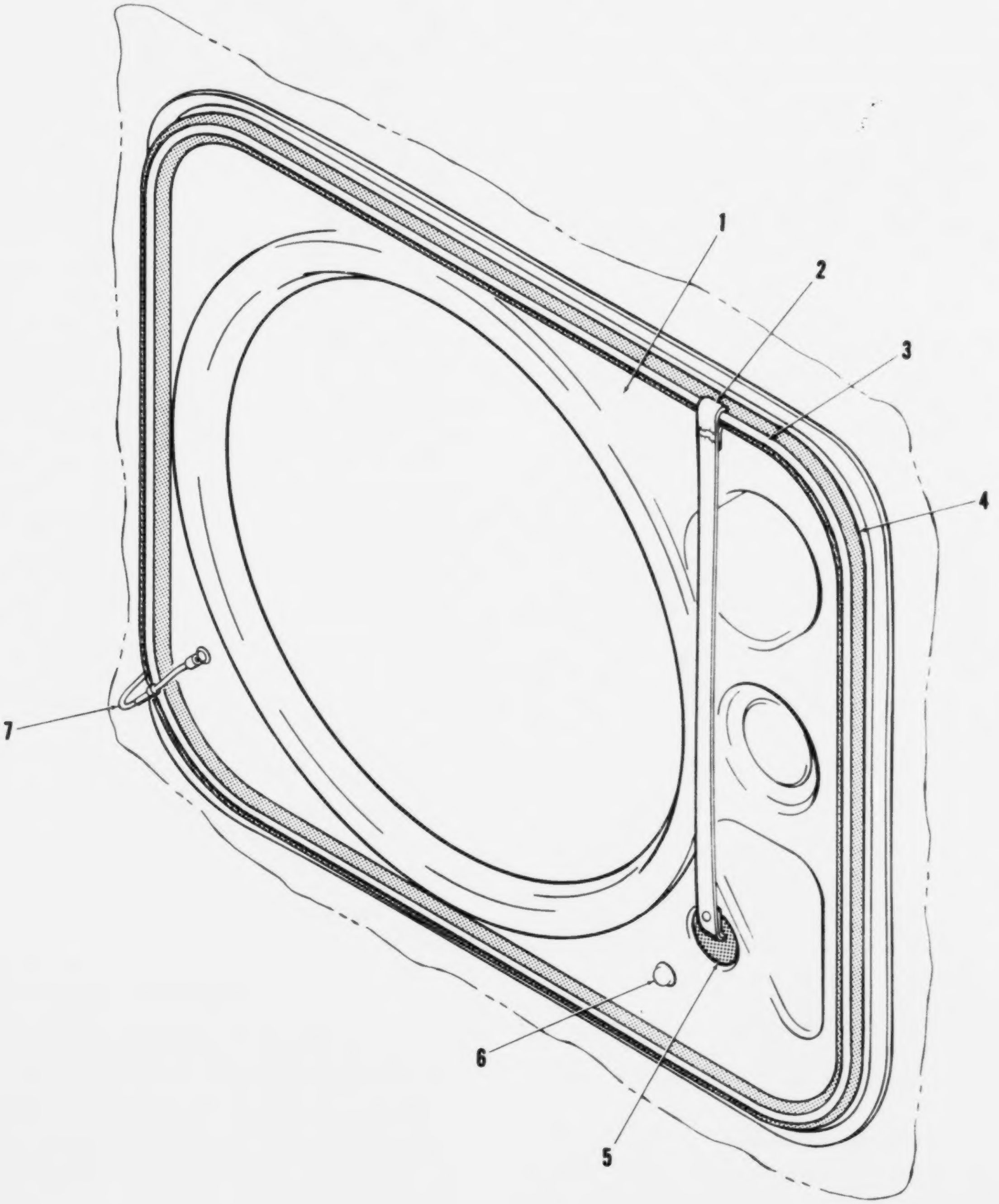
2-124. Removal. (See fig. 2-35.) Proceed as follows:

a. Pull on release strap (2). Use sufficient force to remove seal filler (3) from rubber seal and hatch retainer (4).

b. Push hatch (1) out of the hatch opening.

c. Disconnect quick-disconnect bonding jumper (7) if installed.

2-125. Repair. Burnished nicks, and scratches, and small dents are negligible if burnished and dented area does not interfere with installation of window pane or escape hatch. Holes and spot-drilled cracks, not exceeding limits shown in fig. 2-6 can be temporarily patched. See fig. 2-7, sheet 7. Refer to TM 55-1500-204-25/1 for information on repair of window pane. Damage exceeding the negligible limits



42X48

B114-969-20L

1. Escape hatch
2. Release strap
3. Seal filler
4. Seal and hatch retainer
5. Release grommet
6. Luminous marker
7. Bonding jumper

Figure 2-35. Forward Cabin Section Escape Hatch

can be repaired by patching if edges of escape hatch are not affected. See fig. 2-7 for examples of typical repairs to outer skin and inner pan.

2-126. (Deleted.)

2-127. Installation. (See fig. 2-35.) Proceed as follows.

a. If external release strap (2) has been pulled, insert release grommet (5) into the cutout. Make sure the snap fastener is on the outside.

b. Install rubber seal and hatch retainer (4) using a solution of soap (C312) and water. Start at the center of the forward edge of the hatch. Fit one channel of the seal over the edge of the hatch. Make sure that the flat side of the seal is outboard.

c. Fit hatch (1) into the hatch opening in the helicopter. Use the lubricating solution. Make sure that the outer channel of hatch seal (4) fits snugly into the hatch opening.

WARNING

Install the seal filler in one piece. Otherwise, when the release strap (2) is pulled, the filler will not be completely removed and the hatch will still be held firmly in place. This could result in personnel being trapped during an emergency.

d. Pass seal filler (3) thru the loop of the release strap. Starting at the lower aft corner of the hatch in the cabin, install the seal filler. Use the lubricating solution. Make sure that the release strap is secured within the hatch seal at the top center of the hatch.

e. Connect quick-disconnect bonding jumper (6) if installed.

2-128. Jettisonable Windows.

(See fig. 2-36.) The 10 cabin windows (including the escape hatch window and upper cabin door window) have a release strap for jettison of the window from inside the helicopter. This type of window provides an additional ground emergency exit. Each of the window assemblies consist of a stretched acrylic plastic panel, a rubber retainer seal, a locking strip, and release strap.

2-129. Cleaning. Refer to para 2-67.

2-130. Inspection. (See fig. 2-36.) Inspect the cabin windows, applying the criteria for noncritical optical areas. (Refer to para 2-72).

2-131. Removal. (See fig. 2-36.)

a. Remove the window (1) by pulling the strap (2) with sufficient force to remove the seal filler (3) from the seal and window retainer (4).

b. Push window (1) out of the opening.

2-132. (Deleted.)

2-133. Installation of Window 114S2721-5.(See fig. 2-36.)

NOTE

This installation applies to window pane 114S2721-5, seal 114S2901-16 and seal filler 114S2901-15 only.

a. Inspect the seal and window retainer (4). If the seal is damaged or deteriorated, replace it as follows:

WARNING

Improper installation of cabin windows could result in loss of window in flight or the inability to release the window in an emergency. Seal 114S2901-16 and seal filler 114S2901-15 were designed to retain window 114S2721-5 only. Seal 114S2901-16 is fitted to the airframe and must be cemented to the airframe skin. If not cemented to the airframe skin, the window could be lost during flight. These seals must not be used to install any other window. During window installation or replacement, be sure to use the correct seals and installation procedure for the type window being installed.

(1) Remove the seal filler and seal from around the window opening.

(2) Clean the old adhesive from the structure. Use methyl-ethyl-ketone (C216).

(3) Cut the replacement seal (4) to $63\frac{1}{4}$ to $63\frac{5}{16}$ inches long. Make sure the cut is straight and smooth and is at right angles to the length of the seal.

(4) Apply a light coat of primer (C265) to the structure around the window opening.

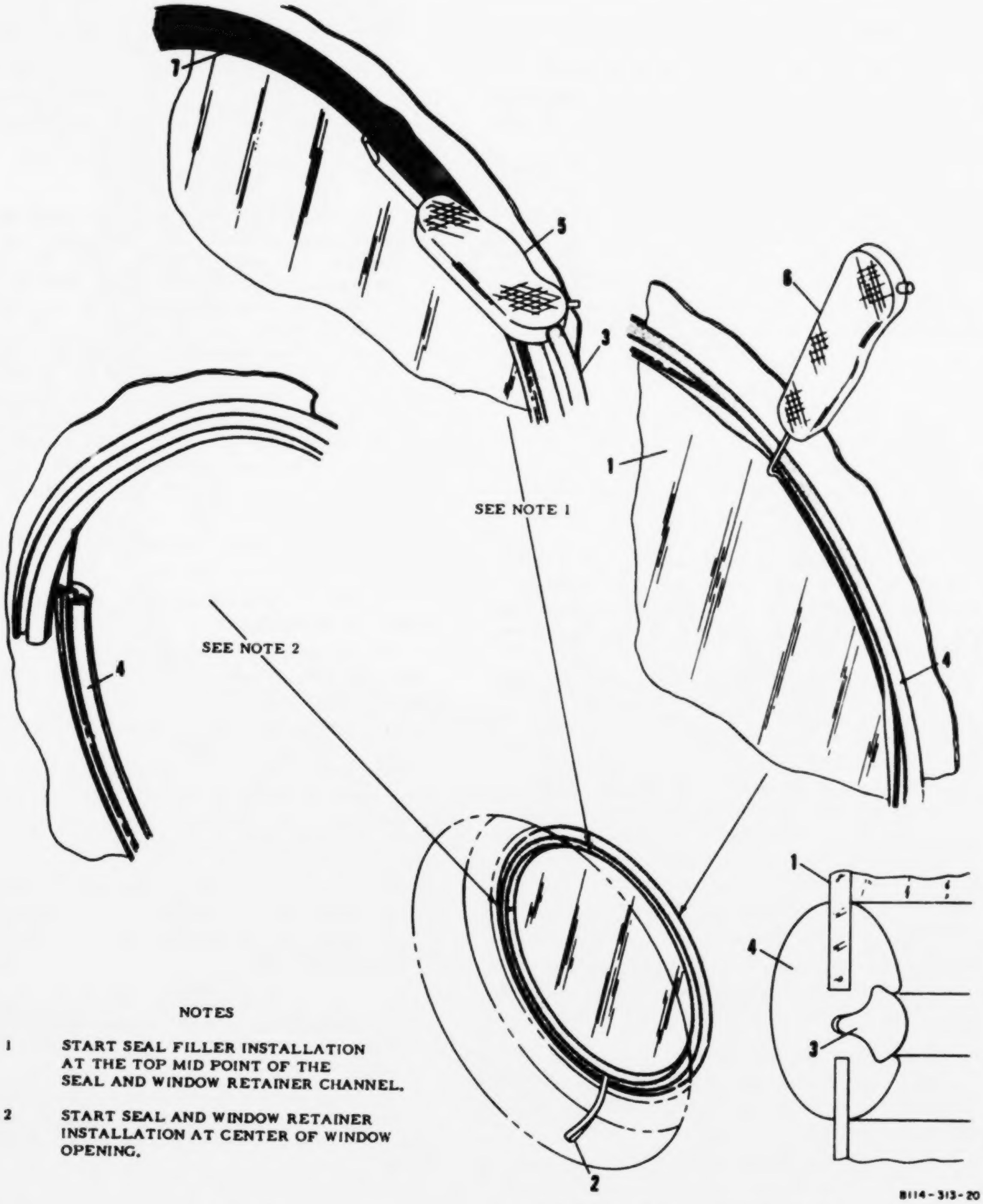
(5) Apply a light coat of cement (C91) to the mating surface of the structure around the window opening. Immediately starting at the forward center of the window opening, install the channel of the seal (4) over the window opening edge. Continue installing the seal to a snug fit around the circumference of the opening and apply a light coat of cement (C91) to the end of the seal to accomplish a butt seal. Apply pressure to the seal (4) as necessary to ensure a positive bond.

NOTE

To ensure a positive bond, complete the installation of the seal (4) as soon as possible after the adhesive is applied.

(6) Clean excess adhesive from the remaining channels of the seal (4) at the butt seal and from the structure around the window opening. Use methyl-ethyl-ketone (C216).

b. Insert the window panel (1) into the seal channel as far as it will go without forcing. Start at the lower end.



NOTES

1 START SEAL FILLER INSTALLATION AT THE TOP MID POINT OF THE SEAL AND WINDOW RETAINER CHANNEL.

2 START SEAL AND WINDOW RETAINER INSTALLATION AT CENTER OF WINDOW OPENING.

1. Window
2. Strap
3. Seal filler
4. Seal and window retainer
5. Seal filler installation tool (tool kit CS1154)
6. Seal and window retainer installation tool (tool kit CS1154)
7. Filler channel

Figure 2-36. Jettisonable Cabin Windows

can be repaired by patching if edges of escape hatch are not affected. See fig. 2-7 for examples of typical repairs to outer skin and inner pan.

2-126. (Deleted.)

2-127. Installation. (See fig. 2-35.) Proceed as follows.

a. If external release strap (2) has been pulled, insert release grommet (5) into the cutout. Make sure the snap fastener is on the outside.

b. Install rubber seal and hatch retainer (4) using a solution of soap (C312) and water. Start at the center of the forward edge of the hatch. Fit one channel of the seal over the edge of the hatch. Make sure that the flat side of the seal is outboard.

c. Fit hatch (1) into the hatch opening in the helicopter. Use the lubricating solution. Make sure that the outer channel of hatch seal (4) fits snugly into the hatch opening.

WARNING

> Install the seal filler in one piece. Otherwise, when the release strap (2) is pulled, the filler will not be completely removed and the hatch will still be held firmly in place. This could result in personnel being trapped during an emergency.

d. Pass seal filler (3) thru the loop of the release strap. Starting at the lower aft corner of the hatch in the cabin, install the seal filler. Use the lubricating solution. Make sure that the release strap is secured within the hatch seal at the top center of the hatch.

e. Connect quick-disconnect bonding jumper (6) if installed.

2-128. Jettisonable Windows.

(See fig. 2-36.) The 10 cabin windows (including the escape hatch window and upper cabin door window) have a release strap for jettison of the window from inside the helicopter. This type of window provides an additional ground emergency exit. Each of the window assemblies consist of a stretched acrylic plastic panel, a rubber retainer seal, a locking strip, and release strap.

2-129. Cleaning. Refer to para 2-67.

2-130. Inspection. (See fig. 2-36.) Inspect the cabin windows, applying the criteria for noncritical optical areas. (Refer to para 2-72).

2-131. Removal. (See fig. 2-36.)

a. Remove the window (1) by pulling the strap (2) with sufficient force to remove the seal filler (3) from the seal and window retainer (4).

b. Push window (1) out of the opening.

2-132. (Deleted.)

2-133. Installation. (See fig. 2-36.)

a. Inspect the seal and window retainer (4). If the seal is damaged or deteriorated, replace it as follows:

(1) Remove the seal from the structure around the window opening.

(2) Clean the old adhesive from the structure. Use methyl-ethyl-ketone (C216).

(3) Cut the replacement seal (4) to 63¼ to 63⁵⁄₁₆ inches long. Make sure the cut is straight and smooth and is at right angles to the length of the seal.

(4) Apply a light coat of primer (C265) to the structure around the window opening.

(5) Apply a light coat of cement (C91) to the mating surface of the structure around the window opening. Immediately starting at the forward center of the window opening, install the channel of the seal (4) over the window opening edge. Continue installing the seal to a snug fit around the circumference of the opening and apply a light coat of cement (C91) to the end of the seal to accomplish a butt seal. Apply pressure to the seal (4) as necessary to ensure a positive bond.

NOTE

> To ensure a positive bond, complete the installation of the seal (4) as soon as possible after the adhesive is applied.

(6) Clean excess adhesive from the remaining channels of the seal (4) at the butt seal and from the structure around the window opening. Use methyl-ethyl-ketone (C216).

b. Insert the window panel (1) into the seal channel as far as it will go without forcing. Start at the lower end.

c. Use the seal and window retainer installation tool 756475 (6) to lift the seal window panel lip. At the same time, slip the window panel (1) into position. Work in both directions from the starting point.

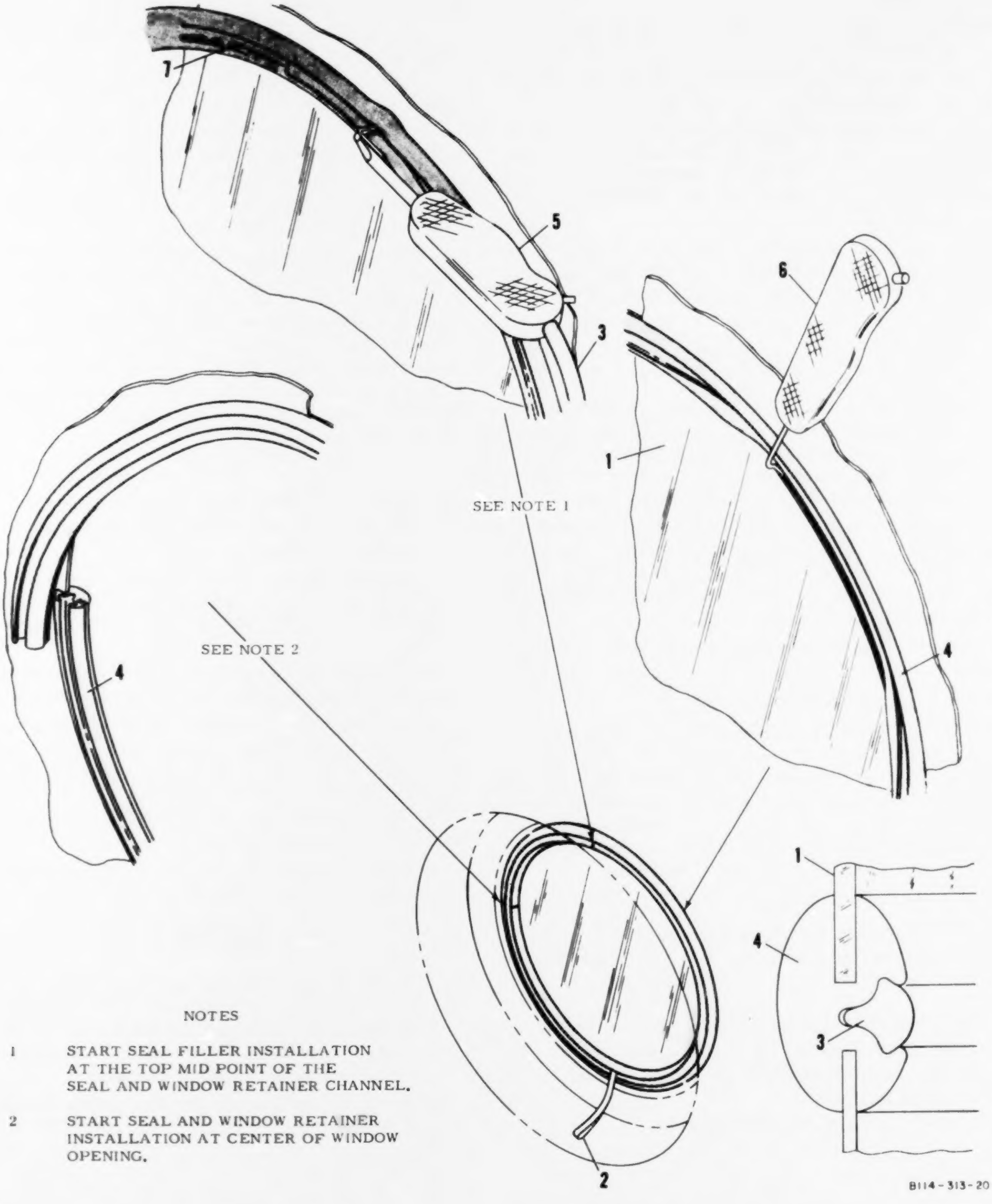
d. Apply soap (C312) and water with a small brush to the filler channel (7) in the seal (4).

e. Insert the seal filler (3) into the handle of the seal filler installation tool 756460 (5).

WARNING

> Install the seal filler in one piece. Otherwise, when the strap (2) is pulled, the filler will not be completely removed and the hatch will still be held firmly in place. This could result in personnel being trapped during an emergency.

f. Install the seal filler (3) into the seal filler strip channel. Start at the top midpoint of the seal (4). When starting,


7
5
6
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SEE NOTE 1
SEE NOTE 2
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2
B114-313-20

NOTES

1 START SEAL FILLER INSTALLATION AT THE TOP MID POINT OF THE SEAL AND WINDOW RETAINER CHANNEL.

2 START SEAL AND WINDOW RETAINER INSTALLATION AT CENTER OF WINDOW OPENING.

1. Window
2. Strap
3. Seal filler
4. Seal and window retainer
5. Seal filler installation tool
6. Seal and window retainer installation tool
7. Filler channel

Figure 2-36. Jettisonable Cabin Windows

NOTE

Window installation tools (5) and (6) shown in fig. 2-36 are included in Kit CS1154 (T153.5).

c. Use the seal and window retainer installation tool (6) to lift the seal window panel lip. At the same time, slip the window panel (1) into position. Work in both directions from the starting point.

d. Apply soap (C312) and water with a small brush to the filler channel (7) in the seal (4).

e. Insert the seal filler (3) into the handle of the seal filler installation tool (5).

WARNING

Install the seal filler in one piece. Otherwise, when the strap (2) is pulled, the filler will not be completely removed and the hatch will still be held firmly in place. This could result in personnel being trapped during an emergency.

f. Install the seal filler (3) into the seal filler strip channel. Start at the top midpoint of the seal (4). When starting, hold the seal filler (3) end in position with the thumb during the first motion of the tool (5). Wiggle the tool slightly in the channel (7) when rounding a corner to make installation easier.

g. Remove the tool (5) when the starting point is reached. If a new seal filler (3) is being used, provide for a slight overlap before cutting the filler strip to allow for a tight joint when both ends are forced into place.

h. Butt the ends and compress the seal filler into the channel. Use the spur on the handle of the seal filler installation tool (5).

2-133.1. Installation of Window 173S2904-3 (See fig. 2-36.)

NOTE

This installation applies to window pane 173S2904-3, seal 173S2904-4 and seal filler 173S2904-5.

a. Inspect the seal and window retainer (4). If the seal is damaged or deteriorated, replace it as follows:

(1) Remove the seal from the structure around the window opening.

(2) Clean the old adhesive from the structure. Use methyl-ethyl-ketone (C216).

(3) Touch-up paint bare skin areas to match internal and external color schemes.

WARNING

Improper installation of cabin windows could result in loss of the window in flight or the inability to release the window in an emergency. Seal 173S2904-4 and seal filler 173S2904-5 were designed to retain window 173S2904-3 only. Seal 173S2904-4 is pressure fit to the airframe skin and must not be cemented to the airframe. If cemented to the airframe skin, the window will require excessive force to be purshed out after removing the seal filler. These seals must not be used to install any other window. During window installation or replacement, be sure to use the correct seal and installation procedure for the type window being installed.

(4) Prefit seal (4) around the window opening. Using about 1 pound hand pressure, fit ends together and cut at right angles to the length of the seal.

(5) Remove seal from window opening. Wipe both ends of seal with alcohol (C54).

(6) Install seal (4) by positioning one end of seal at forward center of opening. Install seal groove over edge of window opening. Continue to install seal around opening to starting point. Do not install end of seal at butt joint. Use seal and window retainer installation tool (6) and work seal around the opening to obtain a snug fit.

(7) Apply a light coat of cement (C90) to both ends of seal (4) at butt joint. Install and press fit ends of seal to provide a good bond at butt joint.

(8) Clean all cement from seal filler channel at butt joint. Use methyl-ethyl-ketone (C216).

b. Immediately position window pane (1) so that part number of pane is at 12 o'clock. Insert window pane into the 6 o'clock position of seal groove as far as it will go.

c. Use seal and window retainer installation tool (6) to lift lip of seal and work window pane into seal groove. Continue to work in both directions from starting point until window pane is completely installed in seal groove.

d. Insert seal filler (3) into handle of seal filler installation tool (5).

WARNING

Install seal filler in one piece. Otherwise, when strap (2) is pulled, filler will not be completely removed and window will still be held firmly in place. This could result in personnel being trapped during an emergency.

NOTE

Soap (C312) and water may be applied with a small brush to seal filler channel (7) to aid in installation of seal filler (3).

e. Starting at top midpoint of seal (4), install seal filler (3) into seal filler channel (7). When starting, hold end of seal filler (3) in position with your thumb during first motion of tool (5). Wriggle tool slightly in channel (7) while working around seal to make installation easier. Continue installation until just before reaching midpoint at bottom of window pane.

f. Remove seal filler installation tool (5) from seal filler (3).

g. Install loop of retained strap (2) over seal filler (3). Position strap at bottom midpoint of window pane as shown.

NOTE

> Do not install a strap on windows located at station 140 in cabin door and the escape hatch.

h. Install seal filler tool (5) on seal filler (3). Continue to install seal filler to starting point. Remove tool (5).

i. Trim seal filler (3) to provide a slight overlap to obtain a tight joint when ends are pushed into seal channel.

j. Butt ends and press them into seal channel. Use spur on handle of tool (5).

2-134. Cockpit Equipment Support Structures.

(See fig. 2-37.) The support structures in the cockpit fuselage structure assembly warranting damage classifications are the forward transmission aft support, lh and rh output bellcrank supports, and the cargo winch and pulley supports. The upper and lower decks of the aft support for the forward transmission are webs reinforced by formed parts and extruded sections. Two supports, are attached, as braces, between upper and lower decks. A typical cargo winch and pully support consists of flanged webs reinforced with extruded sections and formed Z-sections.

2-135. Negligible Damage. See fig. 2-3 for examples of damage to internal webs and formed parts. See fig. 2-8 for examples of damage to the extruded parts. Damage to supports or support backups is limited to defects which after burnishing do not exceed a depth of 10 percent of material thickness or 0.040 inch, whichever is less.

2-136. Reparable Damage. Damage to internal webs affecting less than 50 percent of the cross section can be repaired by patching. Damage to formed parts and extruded parts, not affecting the radius or heel, can be repaired by patching. Damage to internal webs affecting more than 50 percent of the cross section should be repaired by insertion. Damage affecting the radius or heel of a formed part or an extruded part should be repaired by insertion.

2-137. Damage Necessitating Replacement. Extensive damage, such as the loss of a major portion of the length of a member or numerous isolated damages, necessitates replacement of part. Damage or excessive wear to bushings necessitates replacement of bushings. Refer to para 2-577 for information on bushing replacement.

2-138. Cabin Door Coaming.

(See fig. 2-38.) The coaming is made of molded, 6-ply, laminated, plastic-impregnated glass cloth. Formed parts, made of 6060-T6 aluminum alloy, are riveted to the lower sides and bottom of coaming. An angle made of 2024-T4 clad aluminum alloy is riveted to the body skin across top of door opening. Coaming faying surfaces are sealed watertight.

2-139. Inspection. Damage to the impregnated glass cloth parts is limited to slight voids, small wrinkles, or holes which can be filled with a Type A rivet. Damage to formed metal parts is limited to nicks, dents, and scratches which can be removed by burnishing, or to small holes which can be filled with a Type A rivet. Damage must not destroy sealing quality of coaming and must not interfere with door operation.

2-140. Repair (AVIM). (See fig. 2-38.) Damage to formed metal parts not affecting a radius can be repaired by patching. Repair cracks in forward lower corner of coaming as follows:

NOTE

> The coaming may be cracked because the lower rh side longeron is cracked. Refer to para 2-56 for repair of longeron.

a. Stop-drill cracks or remove damaged material, sand, roughen, and clean as directed in TM 55-1500-204-25/1.

b. Cut a patch of glass cloth (C109). This patch will be bonded to existing coaming and will be covered by two stainless steel splice plates. The purpose of the patch is to provide a watertight seal.

c. Fabricate two splice plates from 0.020-inch thick 301 stainless steel, ¼ or ½ hard. Drill necessary attachment holes in splice plates and coaming. Do not install rivets.

d. Prepare a bonding agent as directed in TM 55-1500-204-25/1.

e. Impregnate patch of glass cloth by brushing bonding agent into glass cloth.

f. Wrap patch over damaged area on cabin door coaming.

g. Place a piece of cellophane (C84) over patch. Press patch with a continual smoothing motion to remove air pockets. Carefully remove cellophane.

h. Place splice plates on patch. Install splice plates using blind rivets MS20600AD.

i. Cure patch with heat lamps until exposed portions of patch are hard and tack-free.

j. Extensive damage, such as the loss of more than 50 percent of the length of the member or numerous isolated damages, necessitates replacement. Extensive damage to the forward coaming 114S1623-13 or the aft coaming 114S1623-17 should be repaired by splicing in a section of original coaming.

2-141. Cockpit Flooring.

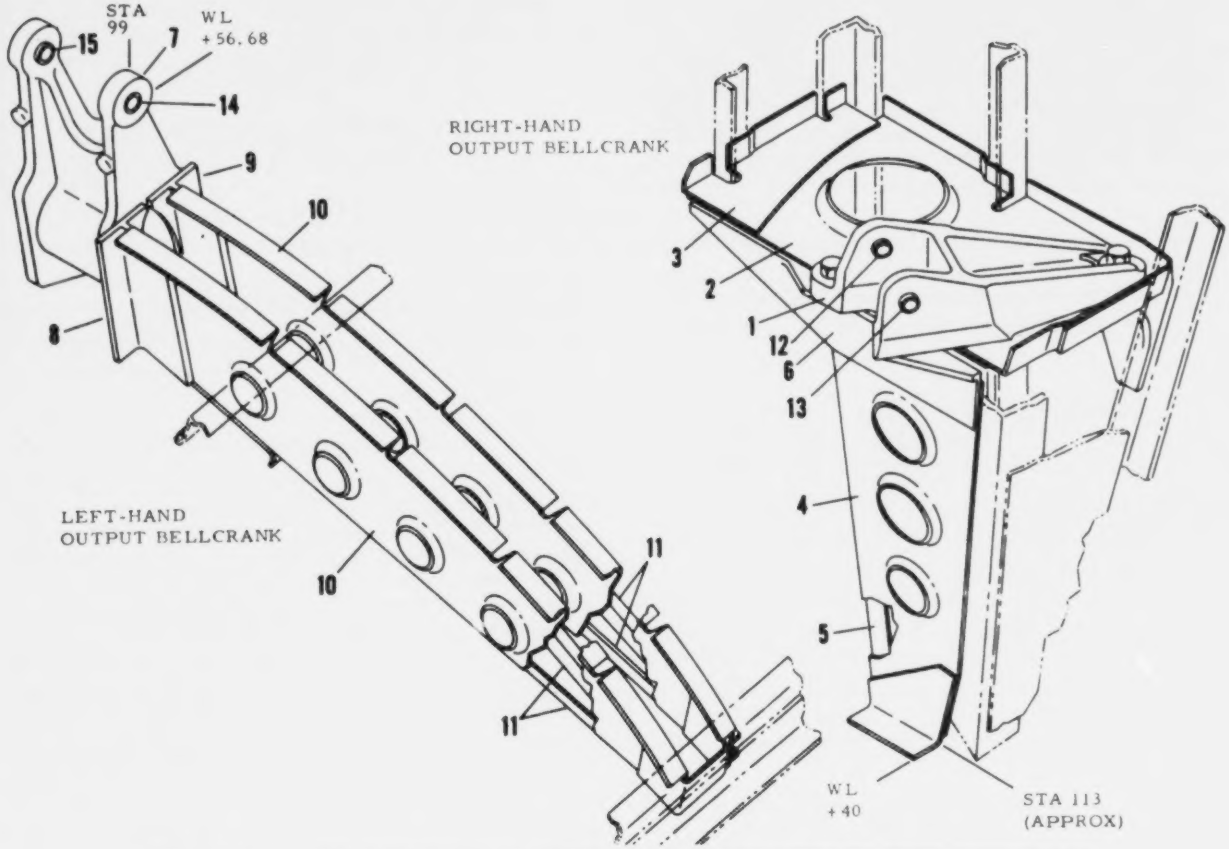
The cockpit floor contains four removable access panels in front of the pilot's seats and two removable access panels beneath the pilots' seats. Each of the most forward panels contains a heel slide. Each slide is riveted to the panel and secured to the supporting structure with turnlock fasteners.

The remainder of the cockpit floor consists of fixed sheetmetal sections. The floor between sta 95 and 120 is a single panel secured to the structure with screws. The cockpit flooring consists of panels of aluminum alloy and magnesium alloy located between sta 51.75 and 95 and a sandwich honeycomb panel consisting of a core, 0.420-inch thick, 3.4¼-15N-3003, conforming to MIL-G-7438, between sta 95 and 120 and bl 8 and 18.

2-142. Inspection of Cockpit Floor. Inspect for the following conditions:

a. Cracks, corrosion, missing rivets or hardware.

b. Pitch-roll-control boot assembly for condition.



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SUPPORT	ZK60-T5 FORGING	NOTE B.
2	WEB	0.050 7075-T6 BARE	0.050 7075-T6 CLAD
3	ANGLE	ALCOA 22477 7075-T6	0.050 4130
4	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
5	ANGLE	AND10135-1002 7075-T6	0.071 4130
6	SUPPORT BACKUP	VS90319 7075-T6	NOTE B.
7	SUPPORT	ZK60A-T5 FORGING	NOTE B.
8	SUPPORT BACKUP	ALCOA 59331 7075-T6	NOTE B.
9	SUPPORT BACKUP	ALCOA 59331 7075-T6	NOTE B.
10	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
11	CAP	ALCOA 22878 7075-T6	0.071 4130
12	BUSHING	NAS77-8-42	NOTE C.
13	BUSHING	NAS75-8-019	NOTE C.
14	BUSHING	NAS75-8-020	NOTE C.
15	BUSHING	NAS77-8-48	NOTE C.

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. IF DAMAGE IS OTHER THAN NEGLIGIBLE, REPLACE WITH A NEW PART AS FOLLOWS:

(1) SUPPORT 114S1881
(6) SUPPORT BACKUP 114S1847
(7) SUPPORT 114S1880-13
(8) SUPPORT BACKUP 114S1843-1
(9) SUPPORT BACKUP 114S1843-2

SUPPORT BACKUPS (6, 8, AND 9) CAN BE REPLACED WITH CORRESPONDING LENGTHS OF ORIGINAL MATERIAL

C. REPLACE WITH NEW PART SAME AS ORIGINAL

42x51

B114-154-345V

Figure 2-37. Equipment Support Structure Repairs—Cockpit Fuselage Structure Assembly

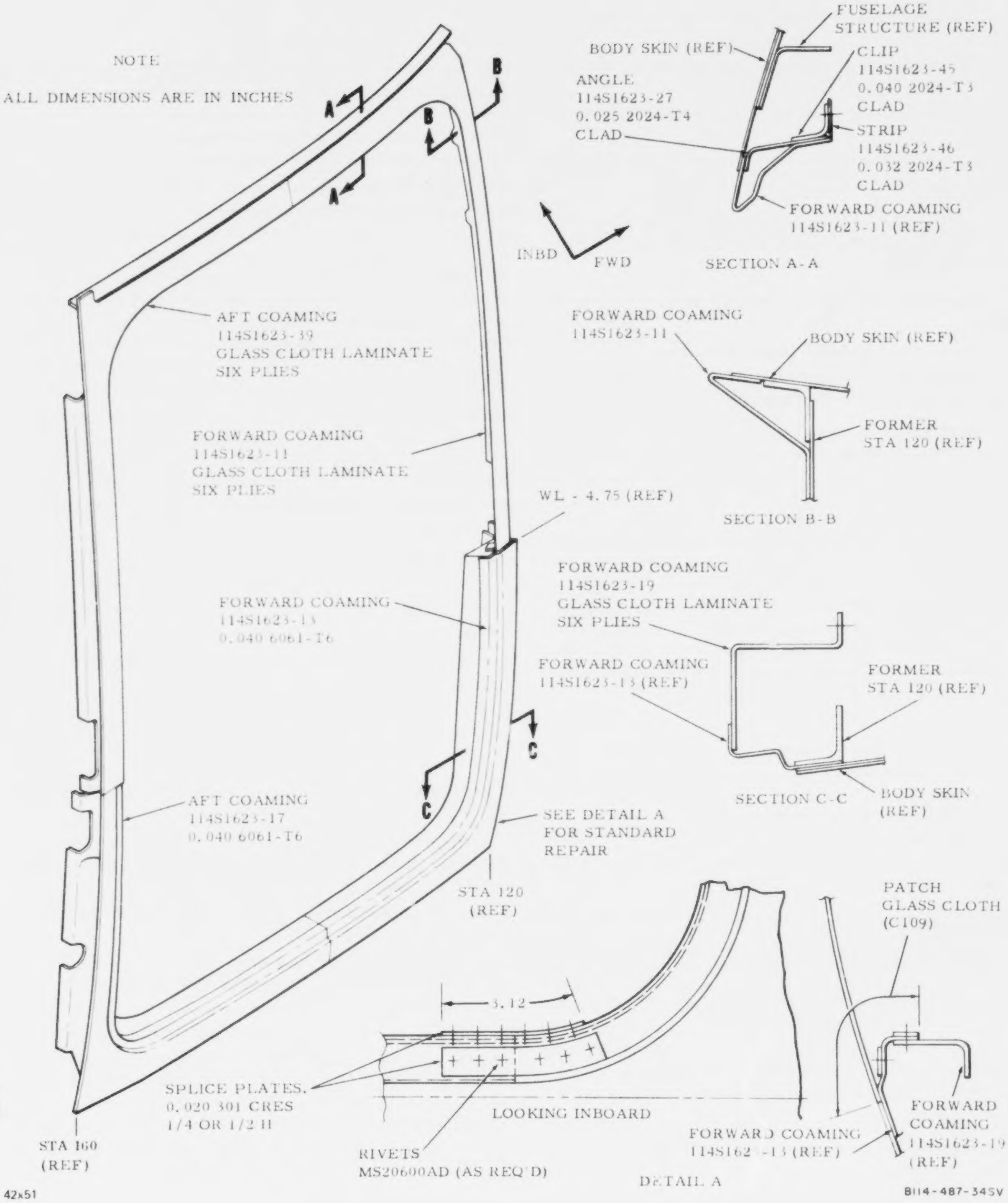

NOTE
ALL DIMENSIONS ARE IN INCHES
A
A
B
B
C
C
AFT COAMING
114S1623-39
GLASS CLOTH LAMINATE
SIX PLIES
FORWARD COAMING
114S1623-11
GLASS CLOTH LAMINATE
SIX PLIES
WL - 4.75 (REF)
FORWARD COAMING
114S1623-13
0.040 6061-T6
AFT COAMING
114S1623-17
0.040 6061-T6
SEE DETAIL A
FOR STANDARD
REPAIR
STA 120
(REF)
STA 160
(REF)
42x51
FUSELAGE
STRUCTURE (REF)
BODY SKIN (REF)
CLIP
114S1623-45
0.040 2024-T3
CLAD
ANGLE
114S1623-27
0.025 2024-T4
CLAD
STRIP
114S1623-46
0.032 2024-T3
CLAD
FORWARD COAMING
114S1623-11 (REF)
INBD
FWD
SECTION A-A
FORWARD COAMING
114S1623-11
BODY SKIN (REF)
FORMER
STA 120 (REF)
SECTION B-B
FORWARD COAMING
114S1623-19
GLASS CLOTH LAMINATE
SIX PLIES
FORWARD COAMING
114S1623-13 (REF)
FORMER
STA 120 (REF)
SECTION C-C
BODY SKIN
(REF)
3.12
SPLICE PLATES,
0.020 301 CRES
1/4 OR 1/2 H
RIVETS
MS20600AD (AS REQ'D)
LOOKING INBOARD
PATCH
GLASS CLOTH
(C109)
FORWARD
COAMING
114S1623-19
(REF)
FORWARD COAMING
114S1623-13 (REF)
DETAIL A
B114-487-345V

Figure 2-38. Cabin Door Coaming Repairs—Cockpit Fuselage Structure Assembly

2-143. Removal. (See fig. 2-39.)

a. Remove the four panels forward of the pilots' seats as follows:

(1) Remove each pitch-roll control boot assembly (3) as follows:

(a) Loosen the fasteners on the boot collar and the fasteners which close the slit in the boot.

(b). Loosen the fasteners which secure the boot to the floor.

(c) Carefully slide the boot up and off the pitchroll control.

(2) Loosen the remaining fasteners which secure the panels (4) and the heel slides (5) to the support structure. Remove the panels.

b. Remove the access panels beneath the pilots' seats as follows:

(1) Remove the pilots' seats. (Refer to para 2-157.)

(2) Remove the attaching bolts and washers from around the circumference of the panels. Remove the panels.

c. Remove the floor panel (1) between sta 95 and 120 by removing the attaching screws from around the perimeter of the panel.

2-144. Repair (See fig. 2-40.)

a. Nicks, dents, and scratches which can be removed by burnishing are permissible. Cracks, not exceeding 1 inch in length, which have been stop-drilled, and small round or oval holes not exceeding a trimmed diameter of ½ inch are permissible. Holes, not exceeding ¼ inch in diameter, can be plugged with a Type B rivet. Type B rivets should be coated with zinc chromate primer (C259) and installed while wet. See fig. 2-8 for examples of damage to extruded parts.

b. (AVIM). Damage affecting an area less than 25 percent of a skin panel, can be repaired by patching. Damage affecting an area more than 25 percent of a skin panel, or which affects boundary members, should be repaired by insertion. Refer to para 2-619 for information on insulation of dissimilar metals when magnesium alloys are used.

2-145. Installation. (See fig. 2-39.)

a. Install the four panels forward of the pilots' seats as follows:

(1) Position the panels (4) on the support structure. Secure them with the turnlock fasteners.

(2) Slide each pitch-roll control boot (3) down over the pitch-roll control. Secure the boot to the floor with the quick-locking fasteners. Snap-fasten the boot collar and the slit in the boot.

b. Install the access panels (2) beneath the pilots' seats as follows:

(1) Position the panel on the structure. Install the attaching bolts and washers.

(2) Install the pilots' seats. (Refer to para 2-158.)

c. Install the floor panel between sta 95 and 120 with the attaching screws.

2-146. Cockpit Equipment.

Cockpit equipment includes insulation, seats, and miscellaneous components. Maintenance information is provided in para 2-147 thru 2-187.

2-147. Acoustic Blankets.

(See fig. 2-41.) Thermal-acoustical blankets are installed throughout the cockpit and cabin to reduce the noise level. Each blanket consists of trim cloth, insulating batting, fabric backing, and impervious membrane. It is flame resistant as well as being a noise reducer.

The blankets are about 1.29 inches thick. Facings may be vinyl coated glass cloth, scrim cloth or fiberglass material per MIL-I-7171, or backing cloth of 40 or 20 ounces per square yard leaded vinyl. Edges and cutouts are trimmed and bound or are coated with lacquer on Kant Fray (C184) to prevent fraying. Fastening tape (hook and pile) is sewn around periphery of blanket, and where required to secure blanket to structure. The blankets are also provided with AN227 socket and grommets as required to match the AN227 studs on the helicopter structure.

Secured by socket fasteners and pile-and-hook fastening tape, the blankets can easily be replaced. In areas where a component is concealed by the insulation blanket, stenciling is provided for the component location. Cutouts, slots, and zippered access panels are provided for component replacement or checks.

2-148. Cleaning. Proceed as follows:

a. Clean the acoustic blankets. Use solvent (C137).

b. Lightly rub the area to be cleaned. Do not soak the blanket.

2-149. Inspection of Acoustic Blankets. Inspect for the following conditions:

a. Tears, cleanliness, fraying.

b. Missing fasteners.

c. Hook and pile tape for condition.

2-150. Removal of Cockpit Acoustic Blanket. (See fig. 2-41.)

a. Pull the edge of the blanket to separate the hook fastening tape on the blanket from the pile fastening tape on the structure.

b. Pull on the blanket adjacent to the socket fasteners, and remove the blanket.

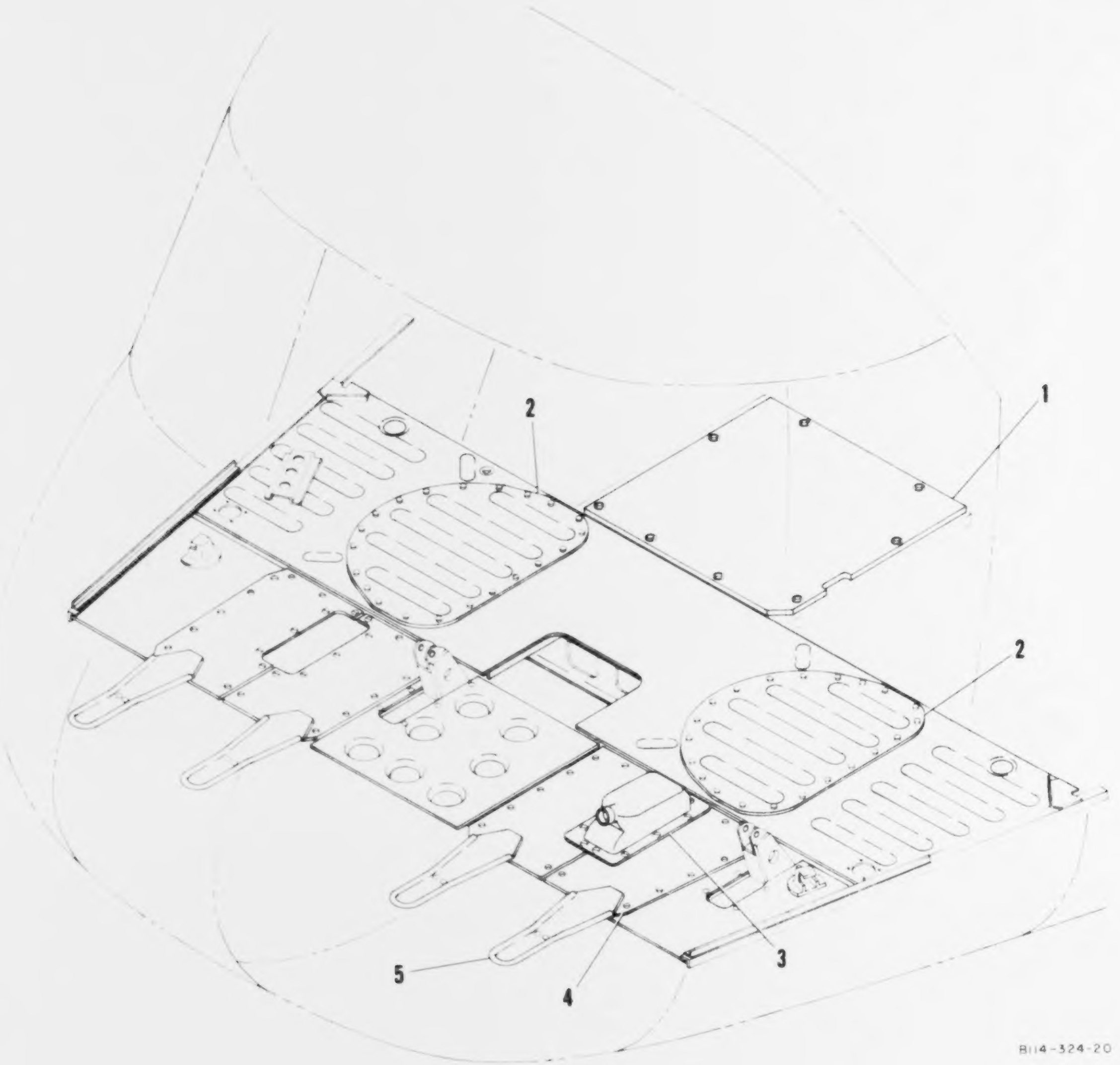
c. Remove the drip pan by repeating step a. Disconnect the drain hose. Loosen the turnlock fasteners and remove the drip pan.

2-151. Repair. (See fig. 2-42.) Negligible damage is limited to holes or tears that can be mended or patched. Repair loose hook tape or pile fastening tape as required to maintain secure blanket installation. Damage that cannot be repaired requires replacement of the blanket assembly.

2-152. Installation of Cockpit Acoustic Blanket. (See fig. 2-41.)

a. Route the hand assist straps, the interphone cords, and the lights thru the blanket openings.

b. Align the socket fasteners on the blankets with the studs on the structure. Press the fasteners to the studs on the structure to engage them.



1. Floor panel
2. Access panel
3. Pitch-roll control boot assembly
4. Access panel
5. Heel slide

Figure 2-39. Cockpit Floor Installation

c. Position and align the blanket edges on the structural support. Align the cutouts for component mounting. Press the blanket edges with hook fastening tape against the pile fastening tape on the structure.

d. Position the transmission drip pan and secure the turnlock. Connect the drain hose. Fasten the blanket in the manner directed in step c. Make sure that the blanket flaps do not leave any gaps or structure exposed in the overhead transmission area.

2-153. Pilot and Copilot Seats.

(See fig. 2-43.) The pilot's seat (right side) and copilot's seat (left side) are identical. A handle on the lower right side near the slide rail controls fore and aft movement of the seat. A handle on the right side of the bucket controls vertical movement of the seat. The seat can be inclined to 15° aft. Seat inclination is controlled by a handle on the aft left side of the bucket. The inertia reel control handle is located on the forward left side of the bucket. Lap-safety belts are attached to the left and right sides of the seat. A shoulder harness is attached to an inertia reel secured to the back of the seat. The pilot's and copilot's seats have provisions for the installation of aircrew protective armor.

2-154. Cleaning. Clean the metal surfaces with cleaning solvent (C137). Wipe nylon surfaces with a damp cloth (C104).

2-155. Inspection. (See fig. 2-43.)

a. Functionally test the seat. (Refer to para 2-156.)

b. Inspect the seat assembly (15) for cleanliness and for obvious defects such as cracks and missing or loose hardware.

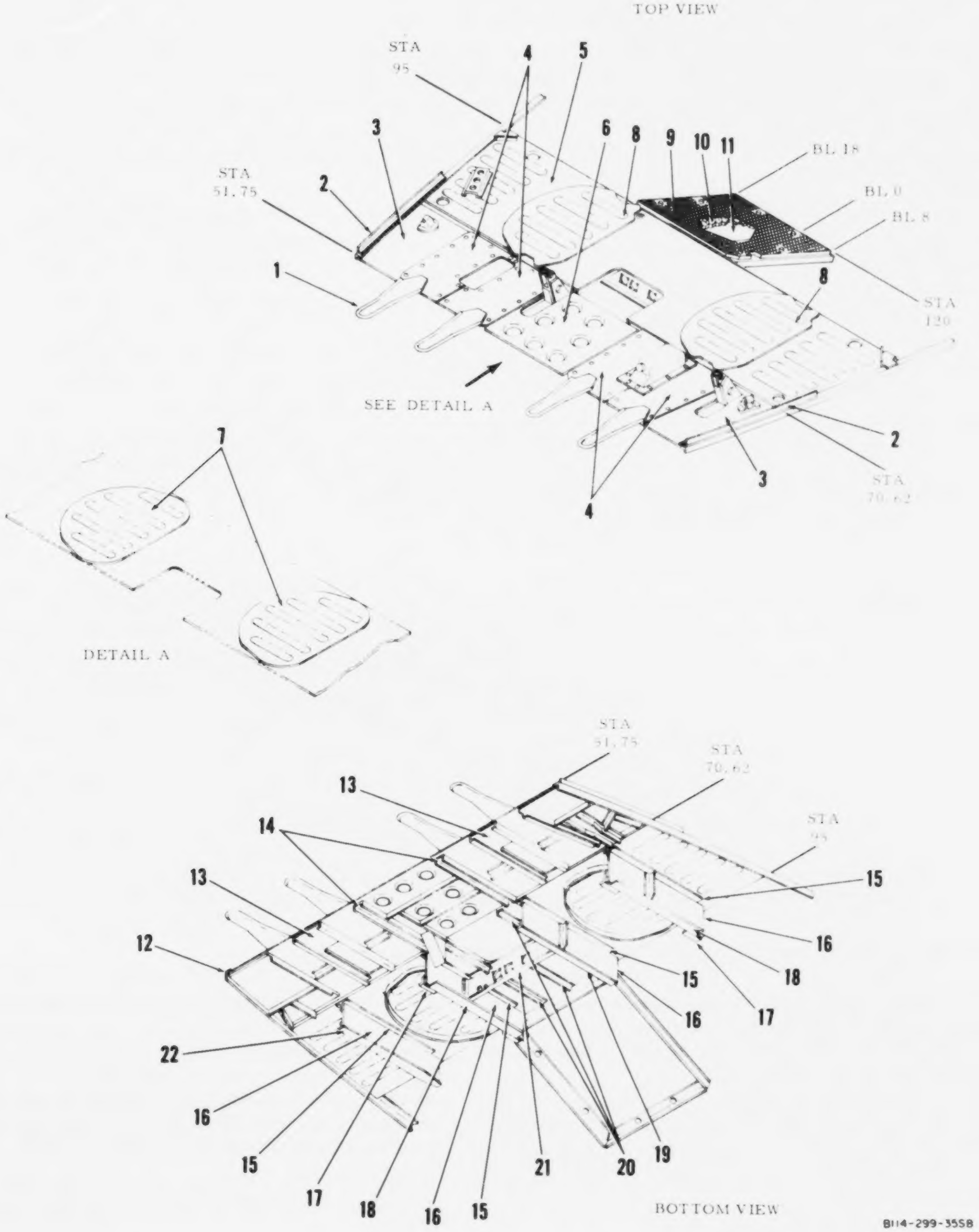

TOP VIEW
STA 95
4
5
3
6
8
9
10
11
BL 18
STA 51.75
2
BL 0
BL 8
1
8
STA 120
SEE DETAIL A
7
2
3
STA 70.62
4
DETAIL A
STA 51.75
STA 70.62
13
STA 95
14
15
13
12
16
15
18
17
16
22
16
15
17
18
16
15
21
20
19
BOTTOM VIEW
B114-299-3558

Figure 2-40. Floor Repairs—Cockpit Fuselage Structure Assembly (Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	HEEL SLIDE	0.025 17-7 PH CRES	NOTE B.	--
2	ANGLE	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	--
3	WEB	0.040 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
4	COVER	0.050 AZ31B-H24 MAG	0.050 AZ31B-H24 MAG	2-7
5	△ WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
	□ WEB	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
6	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
7	△ DOOR	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
8	□ DOOR	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD	--
9	TOP SKIN	0.020 2024-T4 CLAD (RIGIDIZED)	NOTES C. AND D.	--
10	CORE	3.4-1/4-15N-3003	NOTE C.	--
11	BOTTOM SKIN	0.016 7075-T6 CLAD	NOTE C.	--
12	CAP	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	2-7
13	COVER REST	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	2-7
14	CHANNEL	0.050 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
15	CAP	AND10136-1603 7075-T6	0.100 4130	--
16	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
17	ANGLE	BAC1503-2731 7075-T6	0.063 4130	--
18	ANGLE	AND10133-0601 7075-T6	0.071 4130	--
19	CAP	AND10133-0601 7075-T6	0.071 4130	--
20	STIFFENER	ALCOA 22885 7075-T6	0.063 4130	--
21	CHANNEL	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
22	CAP	ALCOA 33495 7075-T6	0.071 4130	--

△ USED ON HELICOPTERS, 66-19098 THROUGH 67-18493
□ USED ON HELICOPTERS, 67-18494 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW HEEL SLIDE, 114S1551-171
C. REFER TO TM55-1500-204-25/1 FOR TYPICAL REPAIRS TO SANDWICH HONEYCOMB STRUCTURE
D. APPLY NON-SKID PAINT (C230) IF REPAIRS ARE MADE WITHINT WALKWAY AREA OR IF EXISTING COATING IS WORN

42x35

B114-156-34SV

Figure 2-40. Floor Repairs—Cockpit Fuselage Structure Assembly (Sheet 2 of 2)

c. Inspect the seat cushions (1) for tears, missing snap fasteners, and cleanliness. Inspect the hook and pile tape for security.

d. Inspect the seat belts (2). (Refer to TM 55-1500-204-25/1.)

e. Inspect the inertia reel (3) and shoulder harness (8). (Refer to TM 55-1500-204-25/1.)

f. Inspect the inertia reel (3) for security. Functionally test the inertia reel. (Refer to para 2-156.)

2-156. Test. Functionally test all modes of seat operation.

a. Test the forward and aft operation of the seat as follows:

(1) (See fig. 2-44.) Sit in the seat. Pull up on the forward and aft travel adjustment handle (4). Operate the seat thru the full range of its fore-and-aft travel. Release the handle.

(2) Check that the lock pins (10) lock the seat in place. Make sure that it requires no more than normal shifting of the body to relieve the weight on the pins.

(3) Pull up on the forward and aft travel adjustment handle (4). Move the seat to the next aft position by pushing on the floor with the feet. Release the handle. Make sure that the seat locks in the next aft position.

(4) Repeat step (3) at each position until the seat is fully aft.

(5) Repeat step (3) going forward until the seat is fully forward.

b. Functionally test the vertical seat operation as follows:

(1) (See fig. 2-43.) Sit in the seat. Raise the vertical adjustment handle (5).

(2) Operate the seat thru the full range of up-and-down travel. Check that the seat moves freely. Release the handle (5).

(3) Raise the seat to the full up position. Push the feet against the floor. At the same time, push against the back of the seat with the shoulders.

(4) Raise the vertical adjustment handle (5) while easing the seat down. Release the control handle. Check

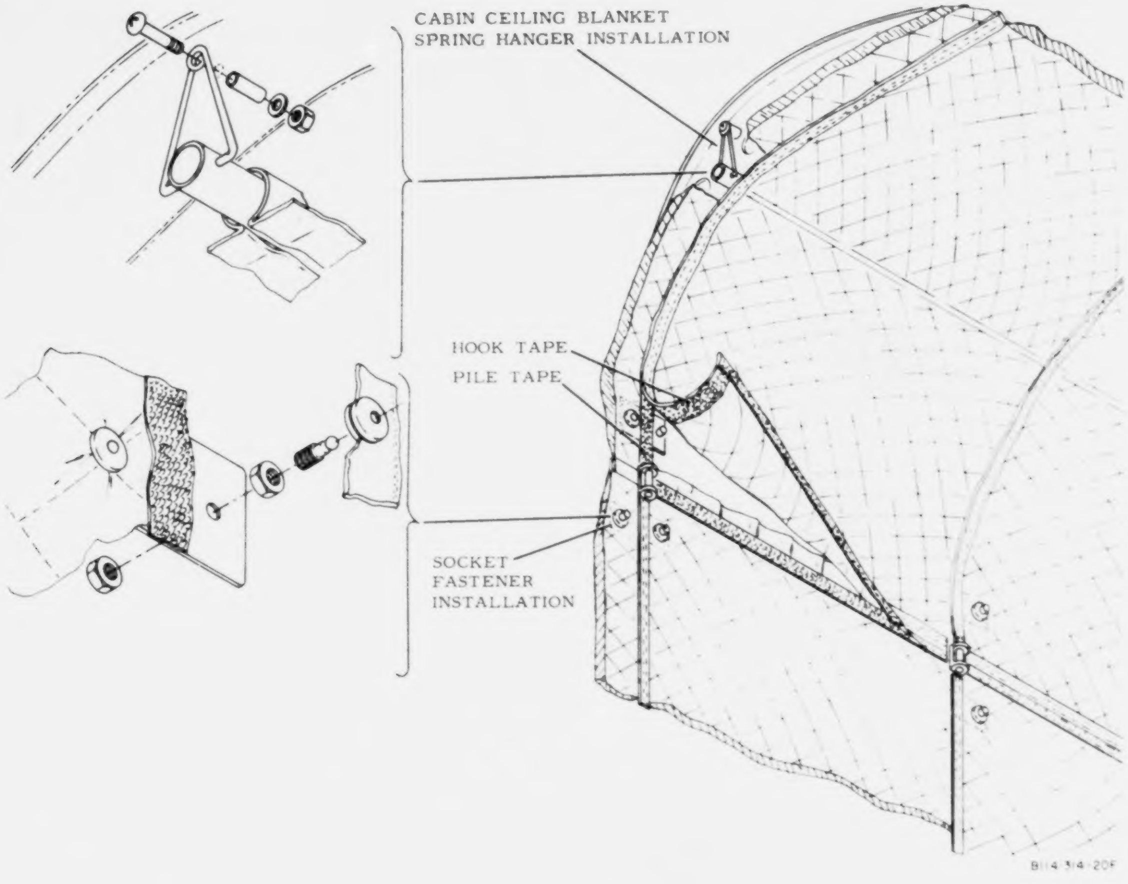

CABIN CEILING BLANKET SPRING HANGER INSTALLATION
HOOK TAPE
PILE TAPE
SOCKET FASTENER INSTALLATION
B114-514-20F

Figure 2-41. Acoustic Blankets

that pins lock in the next position. Make sure that it requires no more than normal shifting of the body or pushing back with the feet to relieve the weight on the lock pins. Repeat this step in every position until the seat is fully down.

(5) Repeat step (4) in every position until the seat is fully up.

c. Functionally test the rotation operation as follows:

(1) Sit in the seat. Raise the rotation adjustment handle (6). Position the seat to full up.

(2) Operate the seat thru its full rotation travel. Release the rotation adjustment handle (6). Check that there are no restrictions.

(3) Push your feet against the floor. At the same time, push against the back of the seat with your shoulders to aid in relieving the weight on the seat.

(4) Raise the rotation adjustment handle (6). As the seat starts down, release the lever. Check that the pins lock in the next position. Make sure that it requires no more than normal shifting of your body or pushing back with your feet to relieve the weight on the pins. Continue to the full down position.

(5) Repeat step (4) to the full up position.

d. Functionally test the inertia reel operation as follows:

(1) Place the inertia reel control assembly (7) aft. Reel the inertia reel strap (10) in and out. The operation should be free and smooth with no restrictions.

(2) Pull the inertia reel strap (10) approximately halfway out and hold it. Strike the strap sharply with the edge of the free hand. The reel should lock from further extension. Relax tension from the strap, the strap should retract and remain locked.

(3) Move the inertia reel control assembly (7) forward, then back. Pull the harness strap (10). The harness should operate in and out freely.

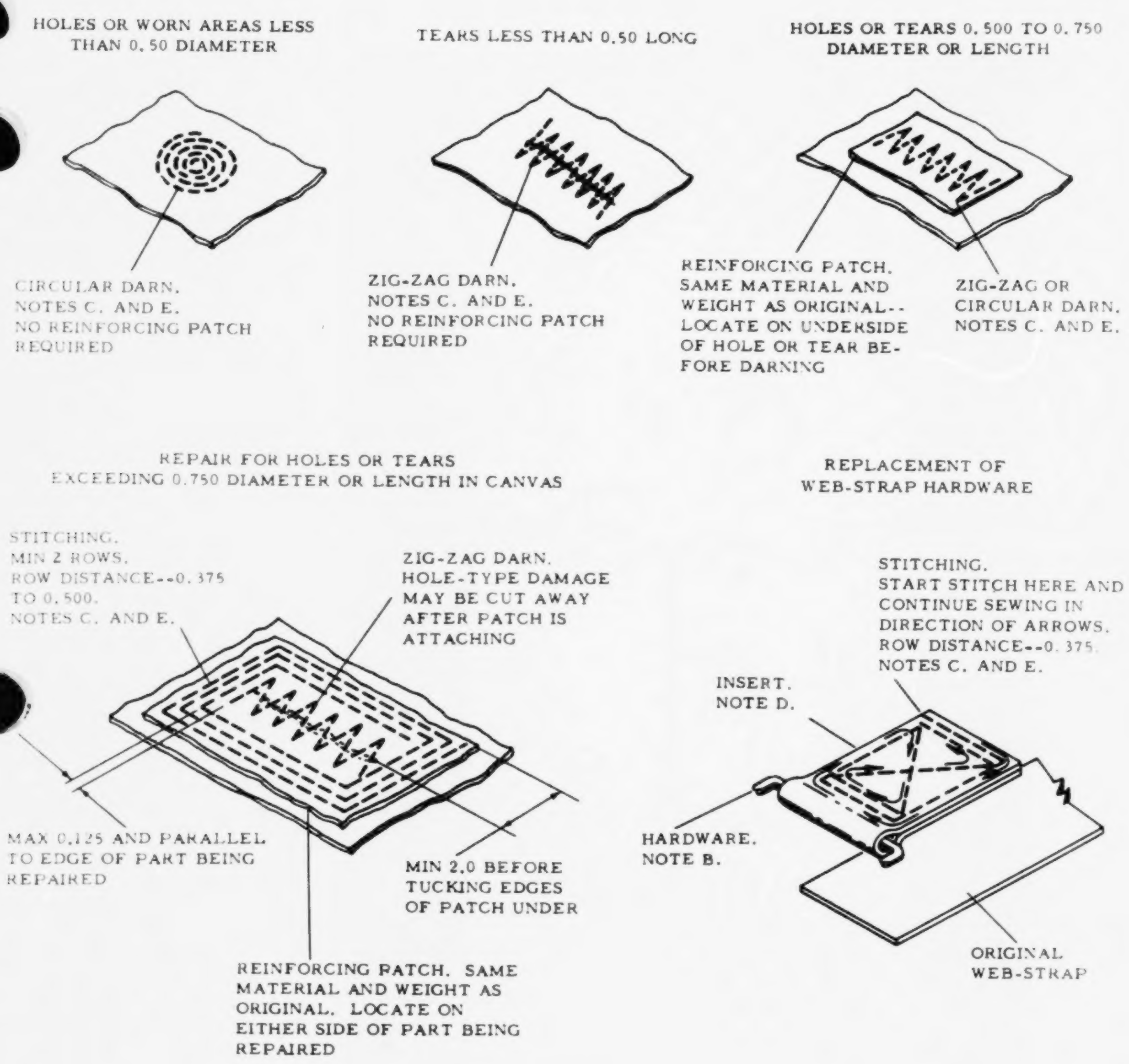
(4) Pull the inertia reel strap (10) halfway out and hold it. Move the inertia reel control assembly (7) forward. The strap should be locked from further extension. Release the strap. The strap should retract and lock.

2-157. Removal of Seats. (See fig. 2-44.)

a. Remove the stop pins (1) installed horizontally in the forward end of each seat track (2).

b. Loosen the roller or slide adjustment bolts (3).

c. Pull up the forward and aft travel adjustment handle (4). Slide the seat forward until the seat rollers or slides (6) clear the track.


HOLES OR WORN AREAS LESS THAN 0.50 DIAMETER
TEARS LESS THAN 0.50 LONG
HOLES OR TEARS 0.500 TO 0.750 DIAMETER OR LENGTH
CIRCULAR DARN. NOTES C. AND E. NO REINFORCING PATCH REQUIRED
ZIG-ZAG DARN. NOTES C. AND E. NO REINFORCING PATCH REQUIRED
REINFORCING PATCH. SAME MATERIAL AND WEIGHT AS ORIGINAL--LOCATE ON UNDERSIDE OF HOLE OR TEAR BEFORE DARNING
ZIG-ZAG OR CIRCULAR DARN. NOTES C. AND E.
REPAIR FOR HOLES OR TEARS EXCEEDING 0.750 DIAMETER OR LENGTH IN CANVAS
STITCHING. MIN 2 ROWS. ROW DISTANCE--0.375 TO 0.500. NOTES C. AND E.
ZIG-ZAG DARN. HOLE-TYPE DAMAGE MAY BE CUT AWAY AFTER PATCH IS ATTACHING
MAX 0.125 AND PARALLEL TO EDGE OF PART BEING REPAIRED
MIN 2.0 BEFORE TUCKING EDGES OF PATCH UNDER
REINFORCING PATCH. SAME MATERIAL AND WEIGHT AS ORIGINAL. LOCATE ON EITHER SIDE OF PART BEING REPAIRED
REPLACEMENT OF WEB-STRAP HARDWARE
STITCHING. START STITCH HERE AND CONTINUE SEWING IN DIRECTION OF ARROWS. ROW DISTANCE--0.375. NOTES C. AND E.
INSERT. NOTE D.
HARDWARE. NOTE B.
ORIGINAL WEB-STRAP

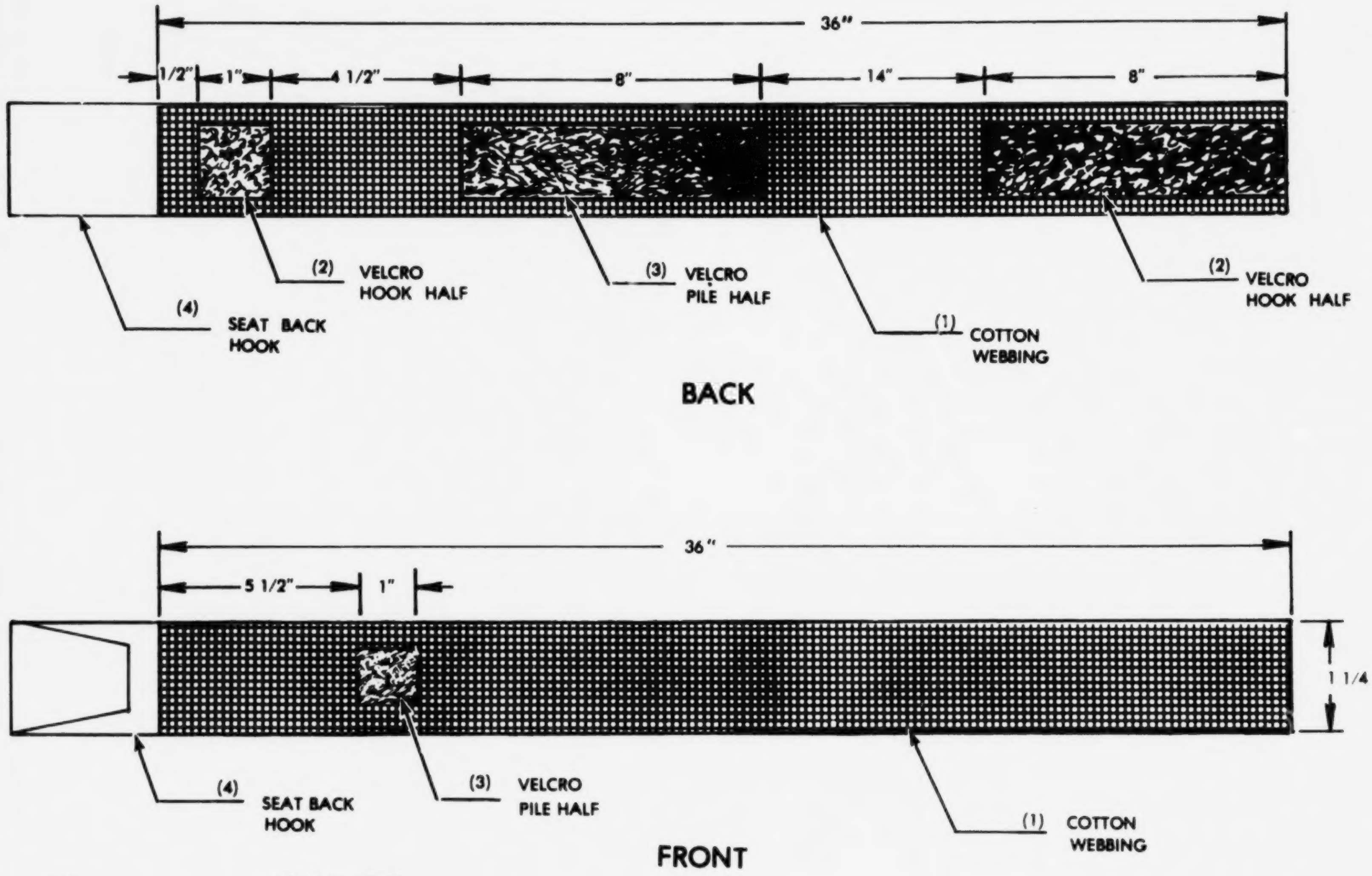
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. USE SAME PART NUMBER HARDWARE AS ORIGINAL
C. STITCHING TO BE IN ACCORDANCE WITH DDD-S-751, 5 TO 8 STITCHES PER INCH DEPENDING UPON WEIGHT OF MATERIAL, USE FEWER STITCHES PER INCH FOR HEAVIER MATERIAL
D. INSERT TO BE SAME MATERIAL AND WEIGHT AS ORIGINAL
E. USE THREAD (C360). COLOR TO MATCH COLOR OF ORIGINAL MATERIAL

42x51

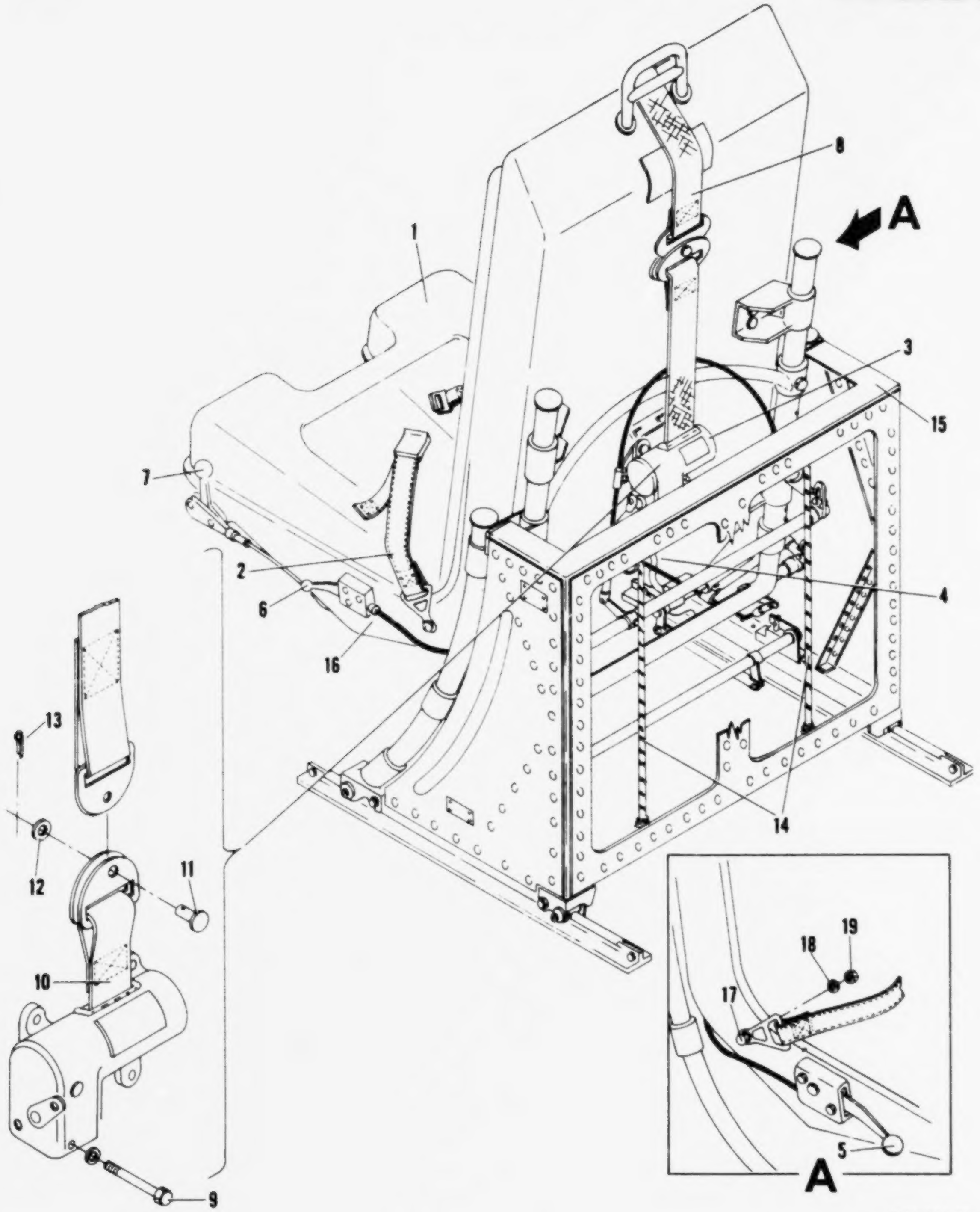
B114-25-34SM

Figure 2-42. Canvas and Webbing Repairs


36"
1/2"
1"
4 1/2"
8"
14"
8"
(2) VELCRO HOOK HALF
(3) VELCRO PILE HALF
(2) VELCRO HOOK HALF
(4) SEAT BACK HOOK
(1) COTTON WEBBING
BACK
36"
5 1/2"
1"
1 1/4
(4) SEAT BACK HOOK
(3) VELCRO PILE HALF
(1) COTTON WEBBING
FRONT

	NSN	NOMENCLATURE
1.	8305-00-261-8579	Webbing
2.	8315-00-926-1612	Fastener tape, hook
3.	8315-00-935-0505	Fastener tape, pile
4.	1680-00-421-7421	Hook, strap

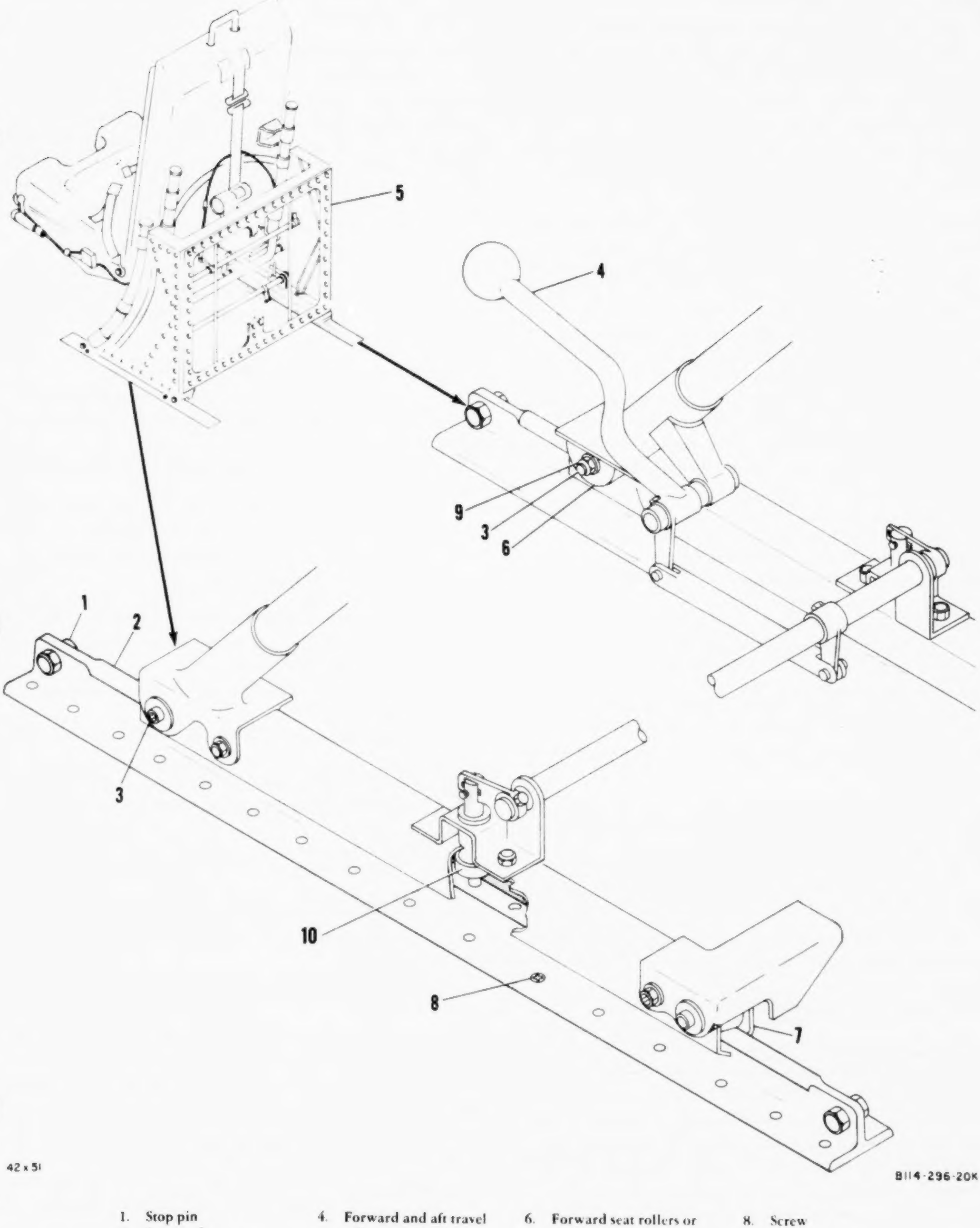
Figure 2-42.1. Seat Stowage Strap Repair



B114-297-20

1. Cushion
2. Seat belts
3. Inertia reel assembly
4. Forward and aft travel adjustment handle
5. Vertical adjustment handle
6. Rotation adjustment handle
7. Inertia reel control assembly
8. Shoulder harness
9. Bolt
10. Inertia reel strap
11. Pin
12. Washer
13. Cotter pin
14. Counterbalance bungee cords
15. Seat assembly
16. Seat bucket assembly
17. Bolt
18. Washer
19. Nut

Figure 2-43. Pilot and Copilot Seat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7
42 x 51
B114-296-20K

1. Stop pin
2. Seat track
3. Adjustment bolt
4. Forward and aft travel adjustment handle
5. Seat assembly
6. Forward seat rollers or slides
7. Aft seat rollers or slides
8. Screw
9. Nut
10. Lock pin

Figure 2-44. Pilot and Copilot Seat Adjustment

CAUTION

> After removal of the seat, adequately support it so that the bottom portion with the rollers or slides will not become damaged.

d. Remove the seat assembly (5) by lifting it upward and away from the track.

e. If the seat tracks (2) are to be replaced, remove the installed tracks by removing the screws (8) which secure the tracks to the floor.

2-158. Installation and Adjustment of Seats. (See fig. 2-44.)

a. If the seat tracks (2) are being replaced, position the replacement track on the floor with the screw holes aligned. Install attaching screws (8).

b. Position the seat assembly (5) on the forward end of the tracks. Make sure that the seat rollers or slides (7) are properly positioned on the track.

c. Pull up the forward and aft travel adjustment handle (4). Slide the seat aft until the forward seat rollers or slides (6) clear the stop pin holes in the forward end of the tracks.

d. Install the stop pins (1) into the forward end of each track (2).

e. Raise the forward and aft travel adjustment handle (4). Slide the seat assembly (5) thru its full range of travel, forward and aft. Check for binding or excessive play. Release the handle to make sure the seat locks in place on the track.

f. Remove excessive play or binding between the seat track and the rollers or slides by adjusting the track rollers or slides. Loosen the nut (9). Turn the bolt (3) clockwise to decrease clearance. Turn the bolt counter-clockwise to increase clearance. **ESTABLISH A MINIMUM CLEARANCE OF 0.010 INCH BETWEEN EACH ROLLER OR SLIDE AND THE TRACK.** Retighten the nut.

2-159. Replacement of Safety Belts. (See fig. 2-43.) The pilot and copilot seats are equipped with adjustable lap-type safety belts fabricated from nylon webbing.

a. Disconnect the belts by removing the bolts which attach the belts to the seat frame at the juncture of the back and the bottom.

b. Clean and inspect the seat belt. (Refer to TM 55-1500-204-25/1.)

WARNING

> Install pilot and copilot safety belts with the release handle pointing left. Improper installation will hamper emergency exit.

c. Assemble each belt with the release handle pointing left. Place the belt and fitting on the inner sides of the eyebolts, insert the bolts from the right, and secure them with nuts.

2-160. Replacement of Seat Cushions. (See fig. 2-43.)

a. Remove cushion (1) by pulling adjacent to the snap fasteners. Disengage the snap fasteners from the seat structure. Separate the hook tape from the pile tape.

b. Install the cushion (1) by engaging the snap fasteners to the seat structure. Press the hook and pile fastening tape together.

2-161. Shoulder Harness and Inertia Reel.

The pilot and copilot seats are equipped with a standard shoulder harness fabricated from nylon webbing. The harness is attached to an inertia reel. When locked, the reel prevents extension of the strap. When unlocked, the reel permits extension of the strap and allows the pilot to lean forward. Each reel is controlled by a handle on the forward left side of the seat. Each shoulder harness is adjustable. It can be shortened by pulling up on the nylon webbing. It can be lengthened by weaving the webbing back thru the buckle. The harness is detachable by removing the cotter pin which secures the harness to the inertia reel strap behind the seat.

2-162. Removal of Inertia Reel. (See fig. 2-43.)

a. Remove cotter pin (13), washer (12), and the pin (11) attaching the shoulder harness (8) to the inertia reel strap (10).

b. (See fig. 2-45.) Remove the clamps (7) retaining cable (4).

c. Remove cotter pin and pin (8) connecting the clevis fitting (9) to the control lever on the reel assembly.

d. (See fig. 2-43.) Remove bolts (9) and the inertia reel assembly (3) from the bucket frame.

2-163. Removal of Inertia Reel Control. (See fig. 2-45.)

a. Remove the bolts and nuts connecting the control housing (1) to the bucket frame.

b. Place the control handle (2) in the manual or forward position.

c. Unscrew knurled nut (3). Slide it off along the cable (4).

d. Pull out the cable end from the inner shaft socket (5).

e. Remove the C washer (6) from the groove in the end of the cable.

2-164. Replacement of Shoulder Harness. (See fig. 2-43.)

a. Disconnect shoulder harness (8) from the inertia reel strap (10) by removing the cotter pin (13), washer (12), and the pin (11).

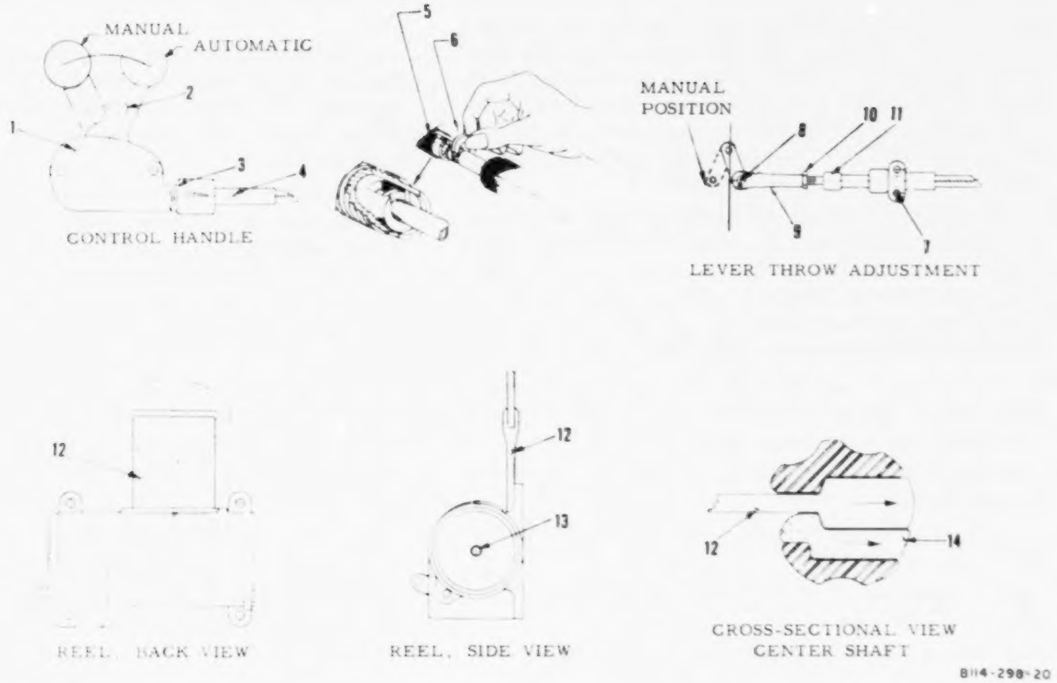
b. Connect shoulder harness (8) to the inertia reel strap (10) with the pin (11), washer (12), and the cotter pin (13).

2-165. Replacement of Inertia Reel Strap. (See fig. 2-43.)

a. Disconnect the reel strap (10) from the harness (8). (Refer to para 2-164.)

WARNING

> The power spring exerts strong turning force on the main shaft and the screw key. Do not release the screw key. Do not let it disengage from the main shaft. Personal injury can occur if the straps reel in abruptly.



1.	Control housing	8.	Pin
2.	Control handle	9.	Clevis fitting
3.	Knurled nut	10.	Locknut
4.	Cable	11.	Sleeve
5.	Inner shaft socket	12.	Strap
6.	Washer	13.	Hole
7.	Clamp	14.	Insert

Figure 2-45. Harness Reel Control and Adjustment

b. (See fig. 2-45.) Fully extend the strap (12). Restrain the strap from retracting by inserting a $\frac{7}{32}$ socket head screw key into the hole (13) and onto the recessed head.

c. Move both strap (12) and the insert (14) in the direction of the arrows. Remove the insert and pull the strap back thru the opening.

d. With the spring positioned ½ to 1½ revolutions back from tight, install the new strap (12). Install the insert (14) towards the side of tee shaft with the single groove.

e. (See fig. 2-43.) Connect the reel strap (10) to the harness (8). (Refer to para 2-162.)

2-166. Installation of Inertia Reel. (See fig. 2-43.)

a. Secure inertia reel assembly (3) to the bucket frame with the bolts (9).

b. Align shoulder harness (8) and inertia reel strap end rings. Secure them with the pin (11), washer (12), and the cotter pin (13).

c. (See fig. 2-45.) Connect clevis fitting (9) to the control lever on the reel assembly with the pin (8) and the cotter pin.

d. Secure control cable (4) with the clamps (7).

e. Adjust the lever throw. (Refer to para 2-168.)

2-167. Installation of Inertia Reel Control. (See fig. 2-45.)

a. Place the C washer (6) in the groove at the end of the cable (4).

b. Insert the cable end into the inner shaft socket (5).

c. Screw the knurled nut (3) onto the shaft.

d. Adjust the inertia reel lever throw. (Refer to para 2-166.)

2-168. Lever Throw Adjustment of Inertia Reel. (See fig. 2-45.)

a. Make sure that all cable clamps are tight. Then loosen the locknut (10).

b. Turn the clevis fitting (9) so that, when finally adjusted and connected in either position of control, the throw lever is ¼-inch on each side of the centerline.

c. Tighten the locknut (10).

d. If necessary, lubricate the rubber sleeve (11). Use dry graphite lubricant (C161).

e. Perform a functional check. (Refer to para 2-156, step d.)

2-169. Troop Commander's Seat.

(See fig. 2-46.) The troop commander's seat is between sta 95 and 120 in the cockpit passageway. When not in use, the seat is stowed to clear the passageway. Troop commander's seats 114ES011-3 (A6632-30) are equipped with an automatic feature which retracts the seat support slide bolts when the backrest is folded forward to an approximate angle of 15° to 20° from horizontal. Troop commander seats 114ES011-3 (ACA4300) are equipped with a handle on the forward beam. The handle operates a mechanism that releases the seat support slide bolts.

2-170. Cleaning and Inspection. Clean the metal surfaces with cleaning solvent (C137). Wipe nylon surfaces with a damp cloth (C104). Inspect structural members for distortion and damage. Replace any defective structural members. Inspect seat surfaces for projections that could snag and damage clothing or injure the seat occupant.

2-171. Removal. (See fig. 2-46.) The recommended position of the seat for removal is the stowed position.

a. Release the seat stowage strap.

b. Remove both hinge bolts (1) from the hinge (2). Remove the seat.

c. Check the bushings in the hinge (2) for wear. Replace the bushings if necessary.

2-172. Disassembly of Seat 114ES011-3 (A6632-30). (See fig. 2-46.)

a. Remove the troop commander's seat. (Refer to para 2-171.)

b. Remove the bolts (3), light washer (4), washer (5), nuts (6) and both hinges (2).

c. Remove nuts (7), washers (8) and bolts (9) from both hinge brackets (10).

d. Remove nuts (11), washers (12), and bolts (13) from both hinge brackets (10). Remove backrest frame (14) from fabric and assembly.

e. Remove screws (15) securing the nylon seat (16) to the aft beam (17).

f. Remove nuts (18), washers (19), and eyebolts (20) from tube assembly (21).

g. Remove pin (22), nut (23), washers (24), spacer (25), bolt (26), plungers (27), and hinge brackets (10) from tube assembly (21). Retain all hardware.

h. Remove nut (28), washers (29), spacer (30), and bolt (31). Remove hinge bracket from tube assembly (32).

i. Remove nut (33), washers (34), and bolt (35) from tube assembly (32).

j. Remove beam (17) from the tube assemblies (21 and 32).

k. Remove tube assembly (21) from beam (41).

l. Remove nut (36), washer (37), light washer (38), and bolt (39) from bracket (40).

m. Remove beam (41) from tube assembly (32) and nylon seat (16).

2-173. Reassembly of Seat 114ES011-3 (A6632-30.) (See fig. 2-46.)

a. Fit the nylon seat (16) to the beam (41) and tube assembly (32).

b. Fit the bracket (40) to beam (41). Align holes in bracket with beam. Install bolt (39) with washer (38) under the head, thru bracket and beam. Secure the bolt (39) with the nut (36) and washer (37) under the nut.

c. Fit tube assembly (21) to beam (41) thru nylon seat (16).

d. Fit beam (17) to tube assemblies (21 and 32). Align holes in bracket with tube assembly (32). Install bolt (35) with washer (34) under the head, thru bracket and beam. Secure the bolt (35) with the nut (33) and washer (37) under the nut.

e. Fit nylon seat (16) to the backrest frame (14).

f. Fit both hinge brackets (10) to backrest frame (14). Install bolts (9) with washers (8) under heads thru hinge brackets (10) and backrest frame (14). Secure the bolts with the nuts (7) and washers (8) under the nuts.

g. Fit both hinge brackets (10) to tube assemblies (32 and 21).

h. Install bolt (31), with washer (29) under the head, thru hinge bracket (10), washer (29), tube assembly (32), washer (29), hinge bracket (10), washer (29), and spacer (30). Secure the bolt (31) with nut (29) and washer (39) under the nut.

CAUTION

Do not tighten the nuts to the extent that they damage the tubes.

i. Install bolt (26) thru hinge bracket (10), washer (24), tube assembly (21), washer (24), hinge bracket (10), washer (24), and spacer (25). Secure the bolt (26) with the nut (23) and washer (24) under the nut. Align nut in proper position. Short cable to aft plunger must be from top of nut (23). Install pin (22).

j. Insert plungers (27) with washers (19) under head of eyebolt (20) thru tube assembly (21). Secure eyebolts (20) with nuts (18) and washers (19) under the nuts.

k. Secure nylon seat (16) to the beam (17) with screws (15).

l. Install hinges (2) to the beams (17 and 41). Install bolts (3), with the light washers (4) under the heads, thru

---

Legend for figure 2-46

1. Hinge bolt
2. Hinge
3. Bolt
4. Light washer
5. Washer
6. Nut
7. Nut
8. Washer
9. Bolt
10. Hinge bracket
11. Nut
12. Washer
13. Bolt
14. Backrest frame
15. Screw
16. Nylon seat
17. Beam
18. Nut
19. Washer
20. Eyebolt
21. Tube assembly
22. Pin
23. Nut
24. Washer
25. Spacer
26. Bolt
27. Plunger
28. Nut
29. Washer
30. Spacer
31. Bolt
32. Tube assembly
33. Nut
34. Washer
35. Bolt
36. Nut
37. Washer
38. Light washer
39. Bolt
40. Bracket
41. Beam
42. Nut
43. Turnbuckle
44. Release
45. Stowage clip
46. Stowage strap

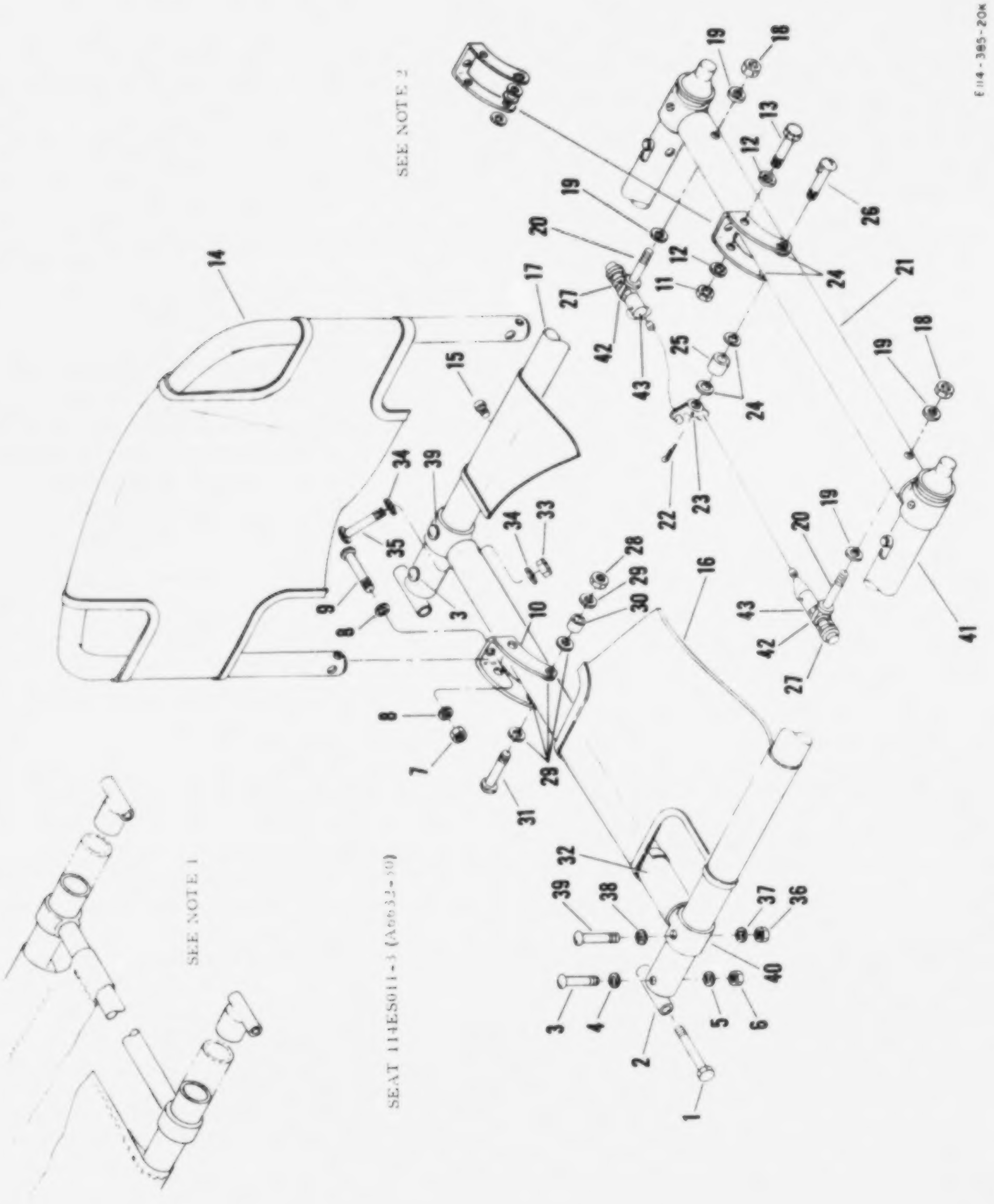

SEE NOTE 2
SEE NOTE 1
SEAT 114ES011-3 (A6632-30)
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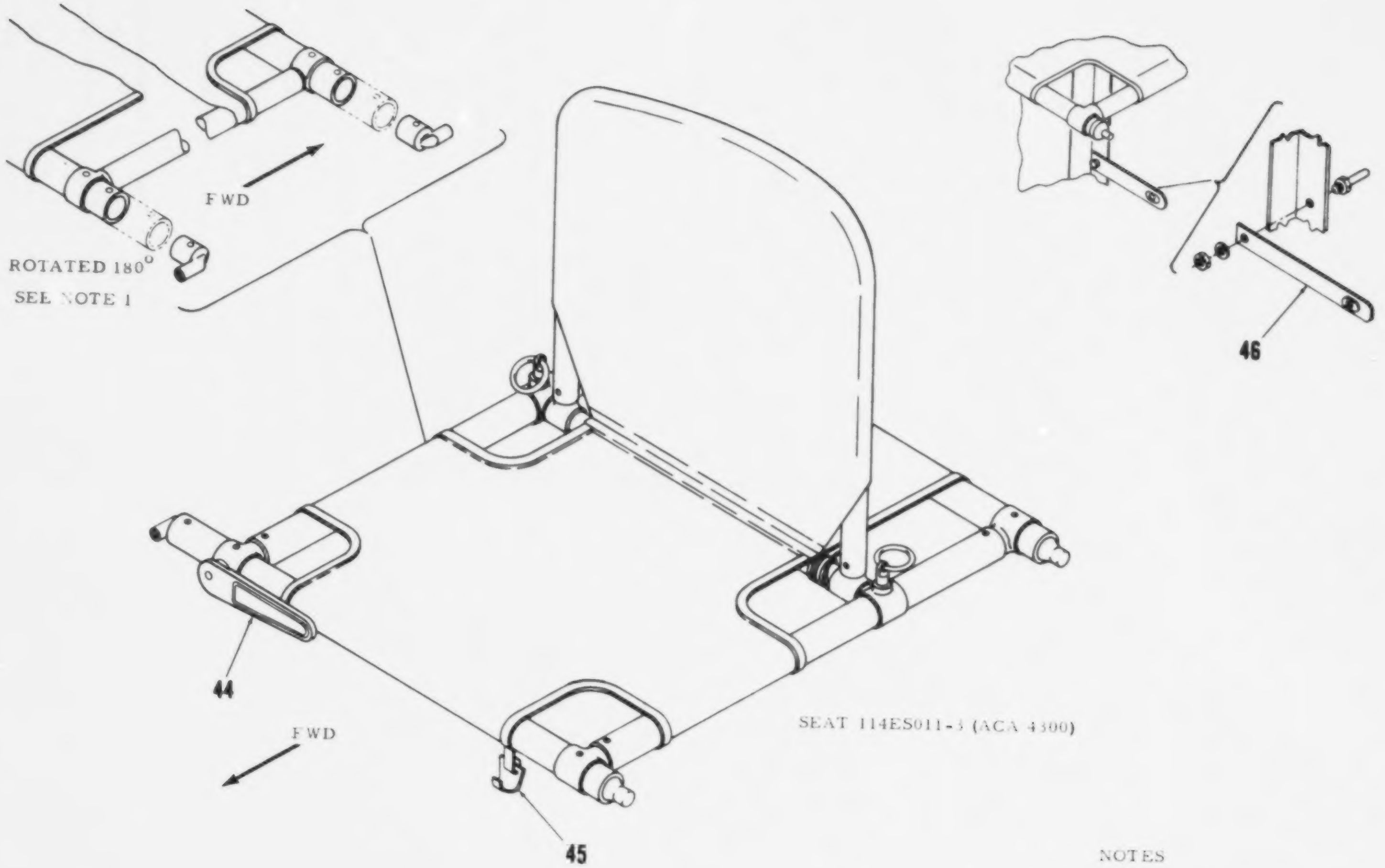
Figure 2-46. Troop Commander's Seat (Sheet 1 of 2)

54 x 39


ROTATED 180°
SEE NOTE 1
FWD
46
44
FWD
45
SEAT 114ES011-3 (ACA 4300)

NOTES

1. THE SHORTER BEAMS ARE INSTALLED ON THE TROOP COMMANDER'S SEAT ON HELICOPTERS WITH CRITICAL COMPONENT PROTECTIVE SYSTEM INSTALLED
2. HINGE BRACKET HAS THREE LIGHT WASHERS INSTALLED AS SHOWN

54 x 39

B114-902-20K

Figure 2-46. Troop Commander's Seat (Sheet 2 of 2)

hinges. Secure the bolts (3) with the nuts (6) and washers (5) under the nuts.

m. Adjust automatic slide bolt release. (Refer to para 2-175.)

2-174. Installation. (See fig. 2-46.)

a. Position the hinges of the seat between the hinge brackets with the bracket inboard.

b. Align the hinge of the seat with the holes in the hinge brackets. Install the hinge bolts. Do not overtighten the bolts. Check the seat for freedom of operation.

c. Stow the seat. (Refer to para 2-176.)

2-175. Adjustment of Automatic Slide Bolt Release. (See fig. 2-46.)

a. Loosen jam nuts (42).

b. Adjust the turnbuckles (43) so that the slide bolts retract when the backrest is folded forward to 5½ to 7½ inches from the horizontal position.

c. Tighten the jam nuts (42).

2-176. Stowing Troop Commanders Seat 114ES011-3 (ACA4300). Proceed as follows: (See fig. 2-46.)

a. Fold the backrest forward.

b. Hook the backrest stowage clip (45) onto the forward bar of the backrest. The stowage clip is attached to the underside of the seat.

c. If applicable, retract the slide bolts into the seat and lower the seat.

d. Secure the seat with stowage strap (46).

2-177. Positioning for Use. Proceed as follows:

a. Release the stowage strap and raise the seat into the usable position.

NOTE

If the armor is removed and the troop commander's seat is to be used, install the fixture. (See fig. 2-47.)

b. If applicable, retract the slide bolts into the seat. Align the slide bolts with the keepers. Release the slide bolts. Otherwise, just raising the backrest will release the slide bolts.

c. Remove the backrest stowage clip from the backrest. Raise the backrest.

2-178. Cockpit Rearview Mirror.

(See fig. 2-48.) On 66-19132 thru 66-19143, code I.1, and subq, a rearview mirror is installed on the center windshield support to enable the pilot to observe the cargo compartment from the cockpit. On 66-19098 thru 66-19131 a rearview mirror is also installed, but the installation is slightly different.

2-179. Inspection of Mirror. Inspect for the following conditions:

a. Mirror for viewing qualities.

b. Security of mirror.

2-180. Replacement and Adjustment. (See fig. 2-48.)

a. Replace and adjust mirror 819NMG (66-19098 thru 66-19131), as follows:

(1) Remove screws (1), washers (2), nuts (3), and mirror (4).

(2) Install mirror (4), using screws (1), washers (2), and nuts (3). Do not tighten the nuts at this time.

(3) Adjust the mirror so that the ramp exit area of the cargo compartment is visible from the pilot's seat.

(4) TIGHTEN NUTS (3) TO 15 TO 25 POUND-INCHES.

b. Replace and adjust the mirror 114E1026 series (66-19132 thru 66-19134, code I.1, and subq) as follows:

(1) Turn mirror (5) out of the windshield support. Remove washers (6).

(2) Install mirror (5) by turning the mirror with washer (6) into the threaded insert in the windshield support.

(3) Adjust the mirror so that the ramp exit area of the cargo compartment is visible from the pilot's seat.

2-181. Ash Receivers.

Three ash receivers are installed in the cockpit: one each for the troop commander, copilot, and pilot. The troop commander's ash receiver is located on the right side of the copilot's seat. The copilot's ash receiver is located in front and to the left of the copilot's seat. The pilot's ash receiver is located in front and to the right of the pilot's seat. To remove an ash receiver for cleaning, turn the ash receiver ¼ turn counterclockwise and remove it from the mount.

2-182. Map and Data Case.

The map and data case is located below the cockpit first aid kit at sta 105 in the cockpit passageway.

2-183. Cockpit Relief Tubes.

(See fig. 2-49.) Two relief tubes are installed in the cockpit. One is on the underside of the pilot's seat. One is on the underside of the copilot's seat. Both the pilot's and copilot's relief tubes are joined at a tee below the floor. A tube is connected from the tee to a venturi mounted externally on the underside of the fuselage.

2-184. Cleaning. Refer to para 1-33.

2-185. Inspection.

a. Inspect the horn for proper attachment and security.

b. After each flight, inspect the tube and horn for cleanliness and freedom from obstruction. Clean if necessary.

c. After each flight, inspect the area around the outlet of the relief tube. Clean if necessary. (Refer to para 1-33.)

2-186. Removal. (See fig. 2-49.)

a. Separate the horn (1) from the hose (2).

b. Remove the screws (3), washers (4), and the bracket (5).

c. Remove the attaching clamps, if necessary, by removing the screws, washers, nuts, and the clamp.

2-187. Installation. (See fig. 2-49.)

a. Install the hose (2) under the seat. Make sure there is approximately 18 inches of slack.

b. Position the bracket (5) and secure it with the screws (3) and the washers (4).

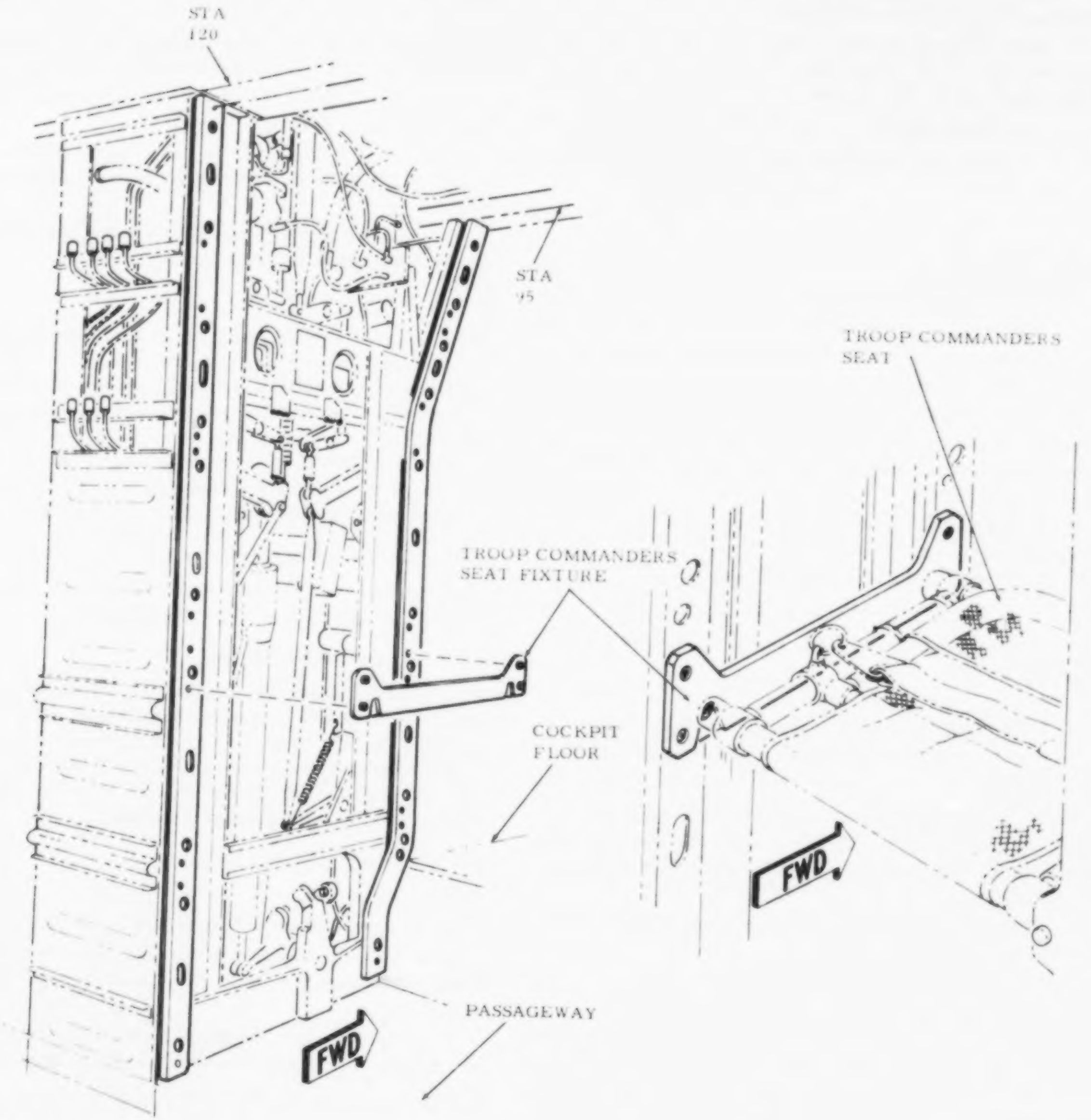
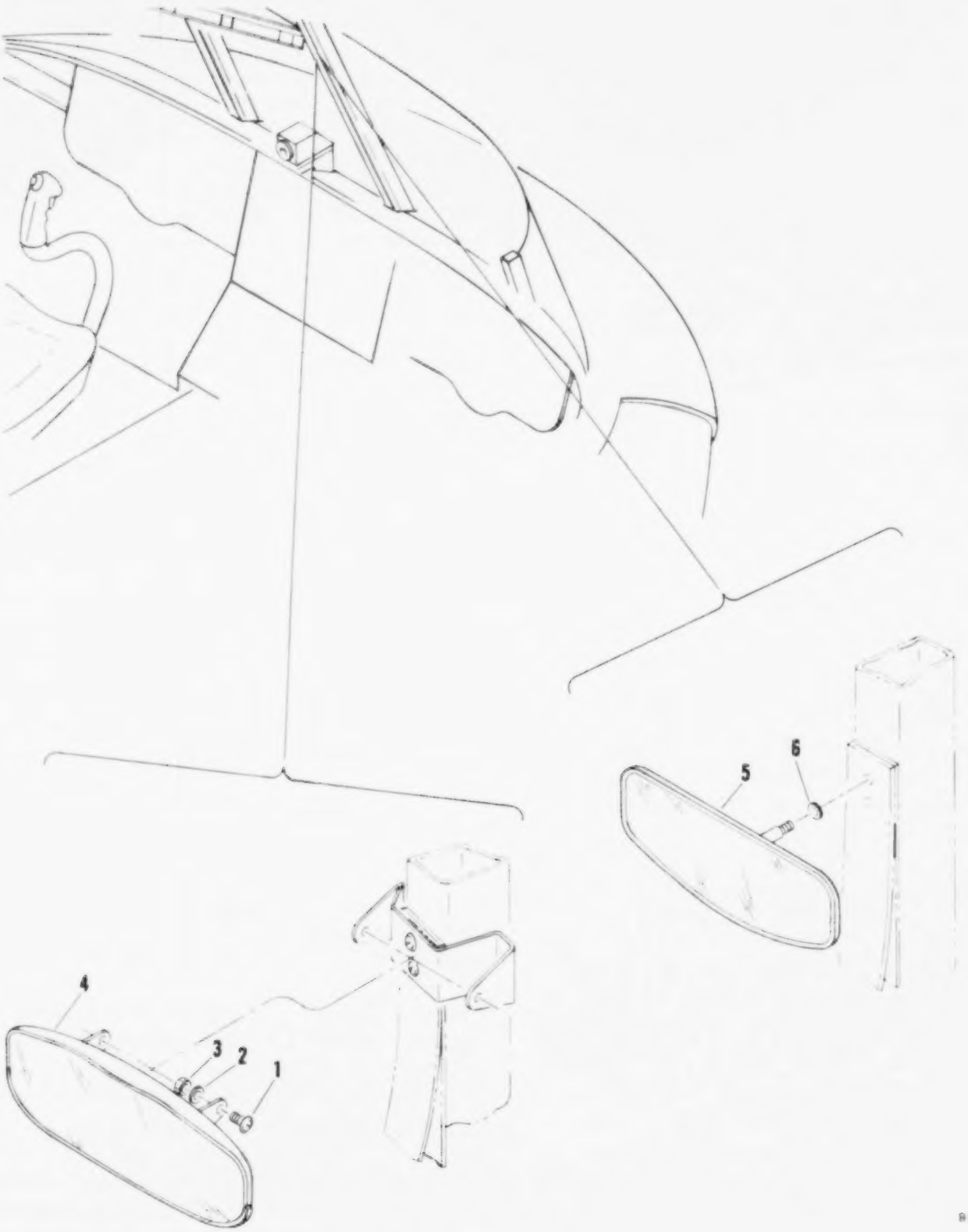

STA 120
STA 95
TROOP COMMANDERS SEAT
TROOP COMMANDERS SEAT FIXTURE
COCKPIT FLOOR
FWD
FWD
PASSAGEWAY
42 x 43
B114-991-20N

Figure 2-47. Troop Commander's Seat Installation Fixture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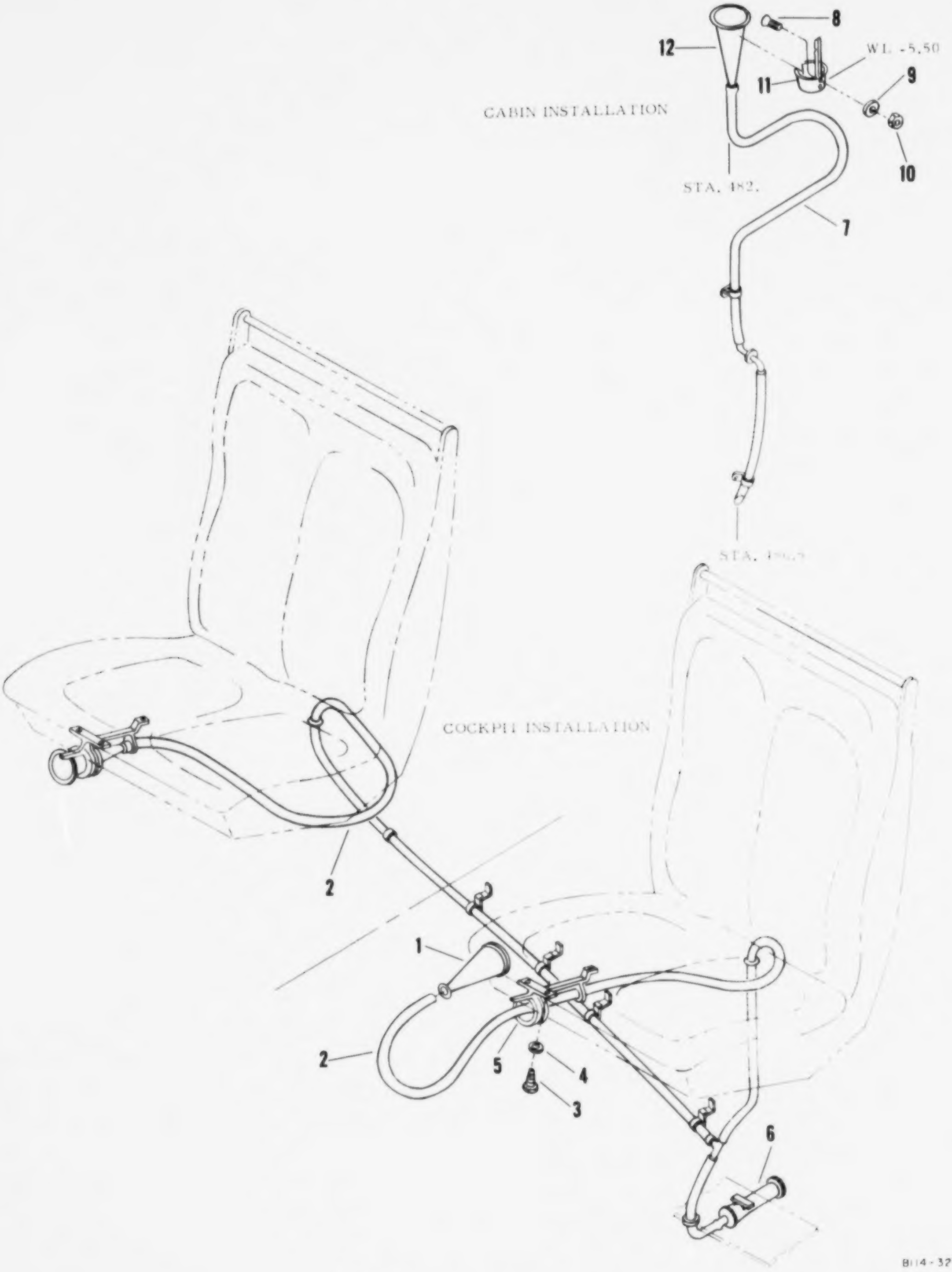
B114-328-20

1. Screw
2. Washer
3. Nut
4. Mirror 819NMG
5. Mirror 114E1026
6. Washer

Figure 2-48. Cockpit Rearview Mirror


8
12
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COCKPIT INSTALLATION
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B114-329-20

1. Horn
2. Hose
3. Screw
4. Washer
5. Bracket
6. Venturi
7. Hose
8. Screw
9. Washer
10. Nut
11. Bracket
12. Horn

Figure 2-49. Relief Tube Installation

c. Install the removed clamps and secure them with the screws, washers, and nuts.

d. Lubricate the end of the horn (1) and join it to the nose (2). Use petrolatum (C244).

2-188. Cockpit Dynamic Absorbers (CH-47B).

(See fig. 2-50 and 2-51.) There are three dynamic absorbers in the forward fuselage section. One is in the nose. Two are below the cockpit floor.

2-189. Nose Dynamic Absorber.

(See fig. 2-50.) One nose absorber, weighing about 150 pounds, is mounted forward of the instrument panel at about sta 30. It is accessible thru the nose access door. The absorber is mounted to the windshield posts. Each post extends from the nose to the forward transmission support structure. At the structure, on modified helicopters, each post is attached to an isolator mount which is fastened to the structure. A hinge at each bottom corner allows the absorber to be lowered without removing it from the helicopter. This permits access to the back of the instrument panel and the interphone junction box.

a. The absorber aids in reducing rotor-induced vibration in the forward structure of the helicopter by means of a spring-mass damping system.

b. The absorber assembly and damping system consist of a case, cover plate, tuning weights, counterweights, case shaft, and springs.

c. Vibrations in the area of the absorbers are translated to the mass of the absorber, causing the mass to oscillate. Oscillation of the mass reduces the vibration amplitudes in this area.

d. Each absorber mass is tuned prior to installation of the unit in the helicopter.

2-190. Inspection of Absorber Installation. Inspect for the following conditions:

a. Security of absorber mounting hardware.

b. Attaching structure for cracks or damage.

c. Isolator mounts for general condition.

2-191. Positioning for Maintenance Access. (See fig. 2-50.) The absorber must be moved for access to the interphone junction box and the back of the instrument panel.

a. Open the nose access door (6).

b. Remove the mounting bolts (1) and washers (2).

c. Swing the absorber (3) forward on the hinges (8). Secure it to the plate (4) with the quick-release pin (5).

2-192. Fabrication of Cable for Quick Release Pin. (See fig. 2-52.)

a. Make a cable assembly CL-100-3-80 (99862) to secure the nose absorber quick-release pin to the helicopter.

b. Cut cable CL-100-3 with nylon cover, about 8 inches long.

c. Run ferrule CL4F (99862) over one end of cable. Run cable thru clip on helicopter and back thru ferrule. Make loop approximately 1 inch diameter. Crimp ferrule in two places with crimping tool ST959A.

d. Run ferrule CL4F over opposite end of cable. Run cable thru ring on quick-release pin and back thru ferrule. Make loop approximately 1 inch in diameter. Crimp ferrule in two places with crimping tool ST959A.

2-193. Removal. (See fig. 2-31.) Refer to table 2-4 for premaintenance requirements.

a. Open nose compartment access door (19).

b. Disconnect strap (3) from the door.

c. Disconnect bonding jumper (20) from the nose structure.

d. Remove door (19) by removing screws (4) and washers (5) or by pulling hinge pin.

e. (See fig. 2-53.) Attach a dynamic absorber handling fixture (T135) to top of absorber. If a handling fixture is not available, make handles as follows:

(1) Use aluminum alloy about ¼-inch thick and 1-inch wide. Make handles as shown.

(2) Drill a $\frac{5}{16}$-inch hole in each end of the handle to fit the absorber bolts.

(3) Attach a handle to each end of absorber. Use bolts AN3-7A without washers.

f. Attach a 300-pound capacity lifting device (crane) to the eyebolt of the handling fixture or to the fabricated handles. Operate lifting device as necessary to partially support the weight of absorber.

g. (See fig. 2-31.) Remove cotter pins (15), hinge pin (13), and washers (14) from the bottom of absorber (16).

WARNING

Make sure the absorber is adequately supported while mounting bolts are being removed. Injury to personnel or damage to helicopter or absorber could result if the absorber drops.

h. While supporting absorber (16), remove bolts (11) and washers (10) that secure the absorber.

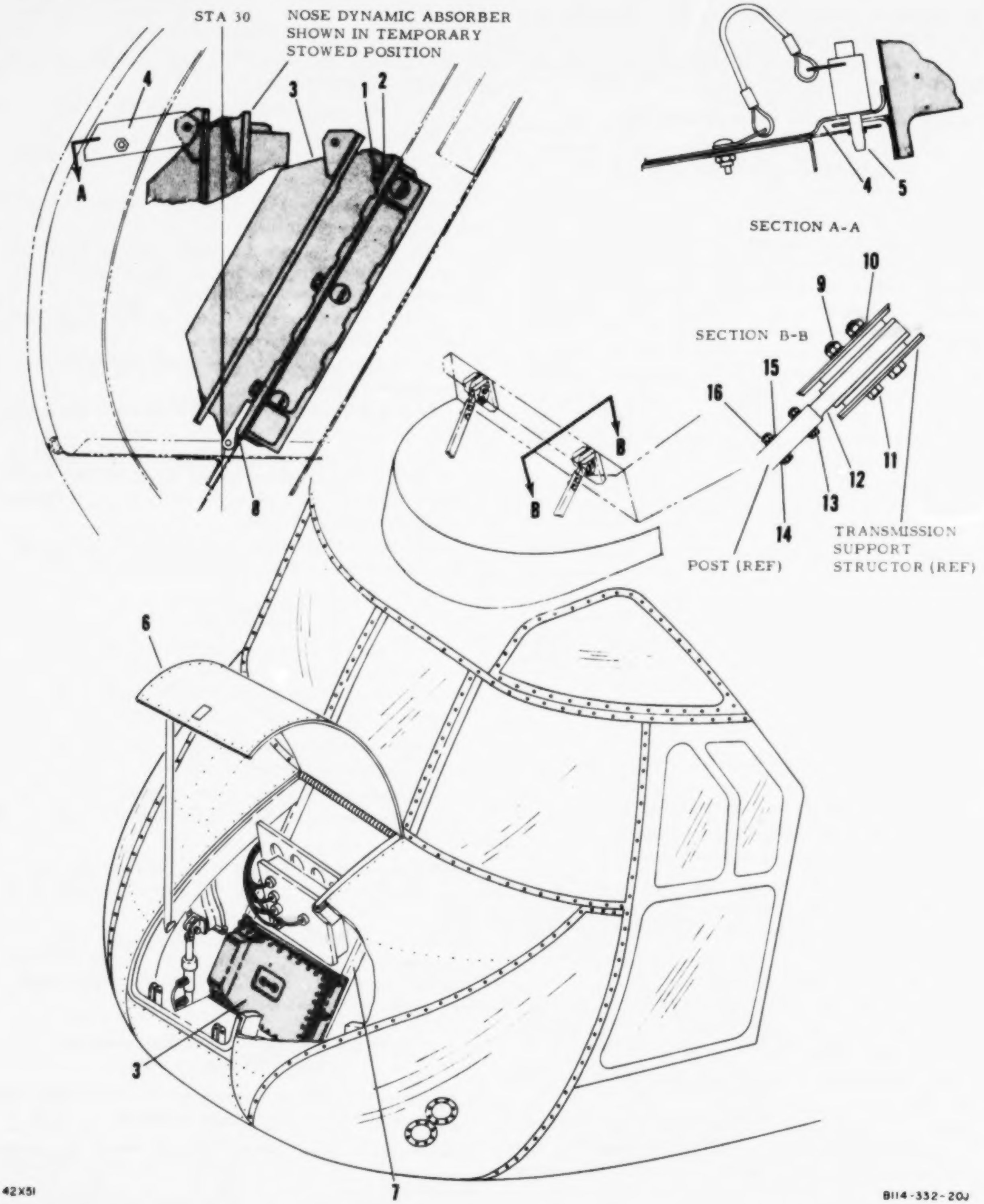
i. Lift absorber (16) out of the helicopter. Place the absorber on a handling adapter (T140) or on a clean flat surface.

j. Remove bolts and handles (9), or the handling fixture from absorber cover (12). Reinstall bolts (17) and washers (18).

2-194. Repair. Repair of fixed frequency vibration absorbers is limited to correcting for missing or loose mounting hardware, repair of cracks in attaching structures and isolator mount damage.

Table 2-4. Premaintenance Requirements for Nose Dynamic Absorber

CONDITIONS	REQUIREMENTS
Model	CH-47B
Part No. or Serial No.	All
Special Tools	T135, Crimping tool ST959A
Test Equipment	None
Support Equipment	300 lb capacity crane
Minimum Personnel Required	3
Consumable Materials	None
Special Environmental Conditions	None


STA 30
NOSE DYNAMIC ABSORBER SHOWN IN TEMPORARY STOWED POSITION
4
3
1
2
A
A
8
SECTION A-A
4
5
SECTION B-B
9
10
15
16
11
12
13
14
B
B
POST (REF)
TRANSMISSION SUPPORT STRUCTOR (REF)
6
3
7
42X51
B114-332-20J

1. Bolt
2. Washer
3. Nose dynamic absorber
4. Plate
5. Quick-release pin
6. Nose access door
7. Mounting support
8. Hinge
9. Nut
10. Washer
11. Bolt
12. Isolator mount
13. Bolt
14. Countersunk washer
15. Washer
16. Nut

Figure 2-50. Nose Dynamic Absorber CH-47B

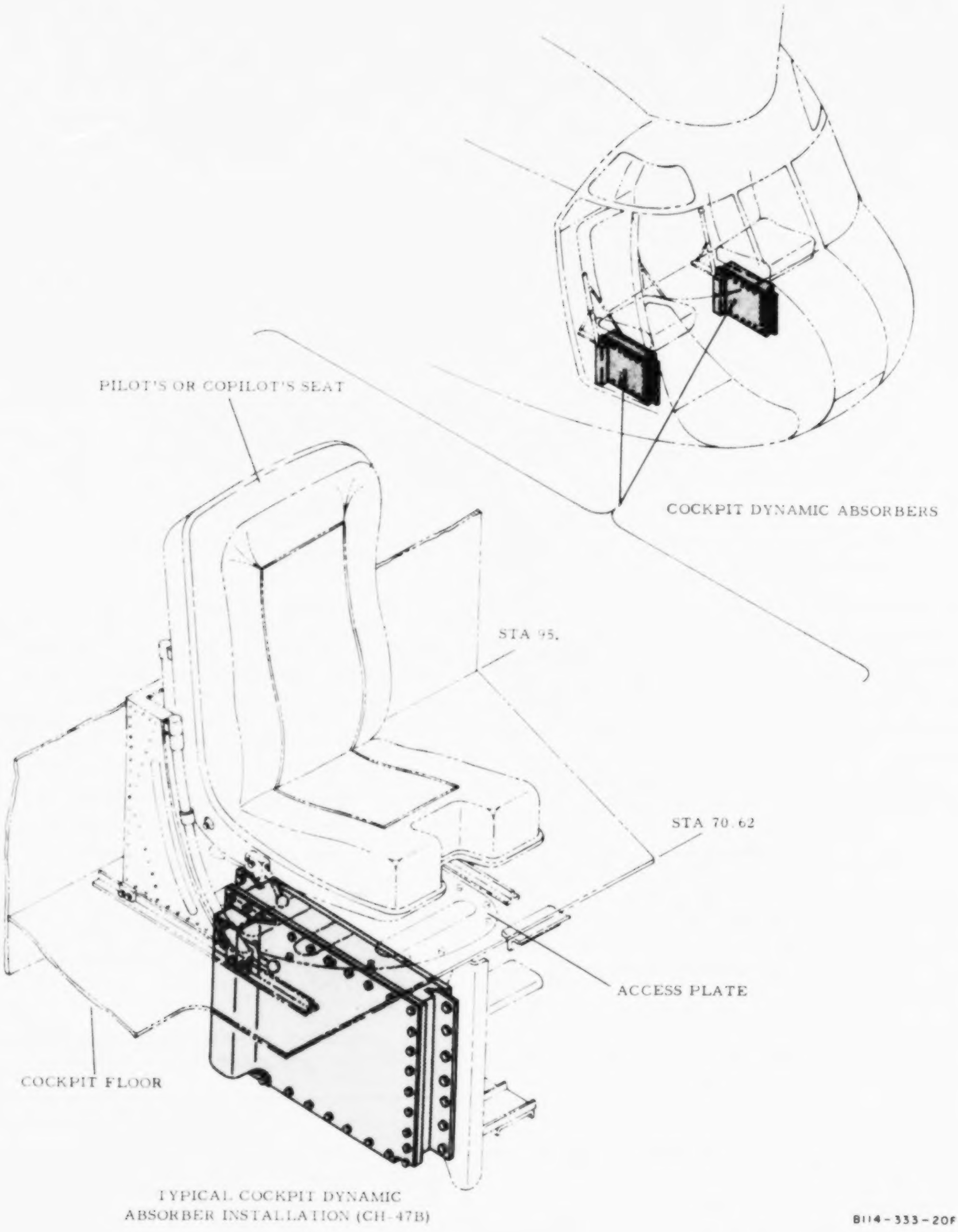

PILOT'S OR COPILOT'S SEAT
COCKPIT DYNAMIC ABSORBERS
STA 95.
STA 70.62
ACCESS PLATE
COCKPIT FLOOR
TYPICAL COCKPIT DYNAMIC ABSORBER INSTALLATION (CH-47B)
B114-333-20F

Figure 2-51. Cockpit Dynamic Absorbers, CH-47B

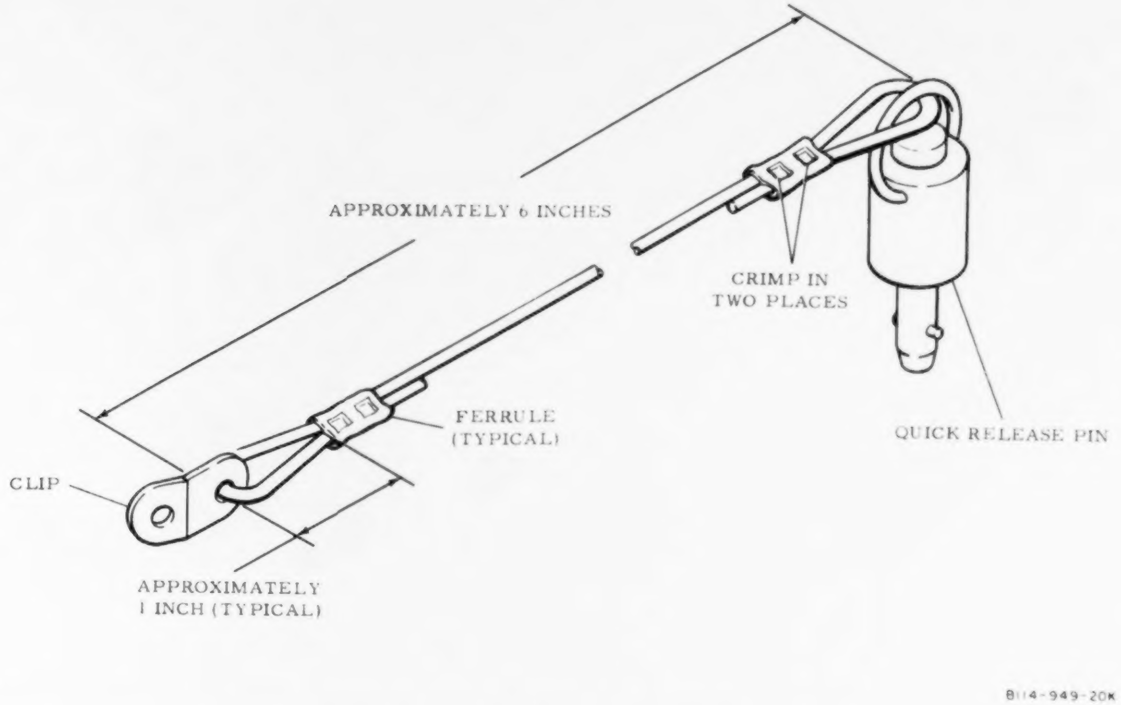


Figure 2-52. Fabrication of Cable Assembly

2-195. Installation. (See fig. 2-31 and 2-53.)

a. (See fig. 2-31.) Inspect the absorber mounting structure for cracks, distortion, loose nutplates, or rivets.

b. Remove bolts (17) and washers (18) as necessary to attach absorber handling fixture (T135) or handles (9), as applicable. Use AN3-7A bolts without washers for handle attachment.

c. Attach a 300-pound capacity lifting device (crane) to the eye bolt of handling fixture or to handles (9).

WARNING

Make sure the absorber is adequately supported while placing it in the nose compartment. Injury to personnel or damage to helicopter or absorber could result if the absorber should drop.

d. Position absorber (16) on the mounting brackets in the nose compartment.

e. Align absorber mounting holes with holes in the bracket. Install bolts (11) and washers (10).

f. Install hinge pins (13) with washers (14). Secure the hinge pin with cotter pins (15).

g. Remove holding fixture or bolts and handles (9) from absorber cover (12).

h. Reinstall bolts (17) and washers (18).

i. Install nose compartment access door (11). (Refer to para 2-113.)

2-196. Cockpit Dynamic Absorbers.

For premaintenance requirements for the cockpit dynamic absorber, refer to table 2-5. (See fig. 2-51.) There are two dynamic absorbers, weighing about 150 pounds each, mounted in the cockpit. They are installed between sta 70.62 and 95 under the cockpit floor. Both absorbers are mounted in a vertical axis, one below the pilot's seat and the other below the copilot's seat. An access plate under each seat permits access to the area of the absorbers for removal. These absorbers are similar to the nose absorber. (Refer to para 2-189.)

2-197. Inspection. Inspect for the following conditions:

a. Security of absorber mounting hardware.

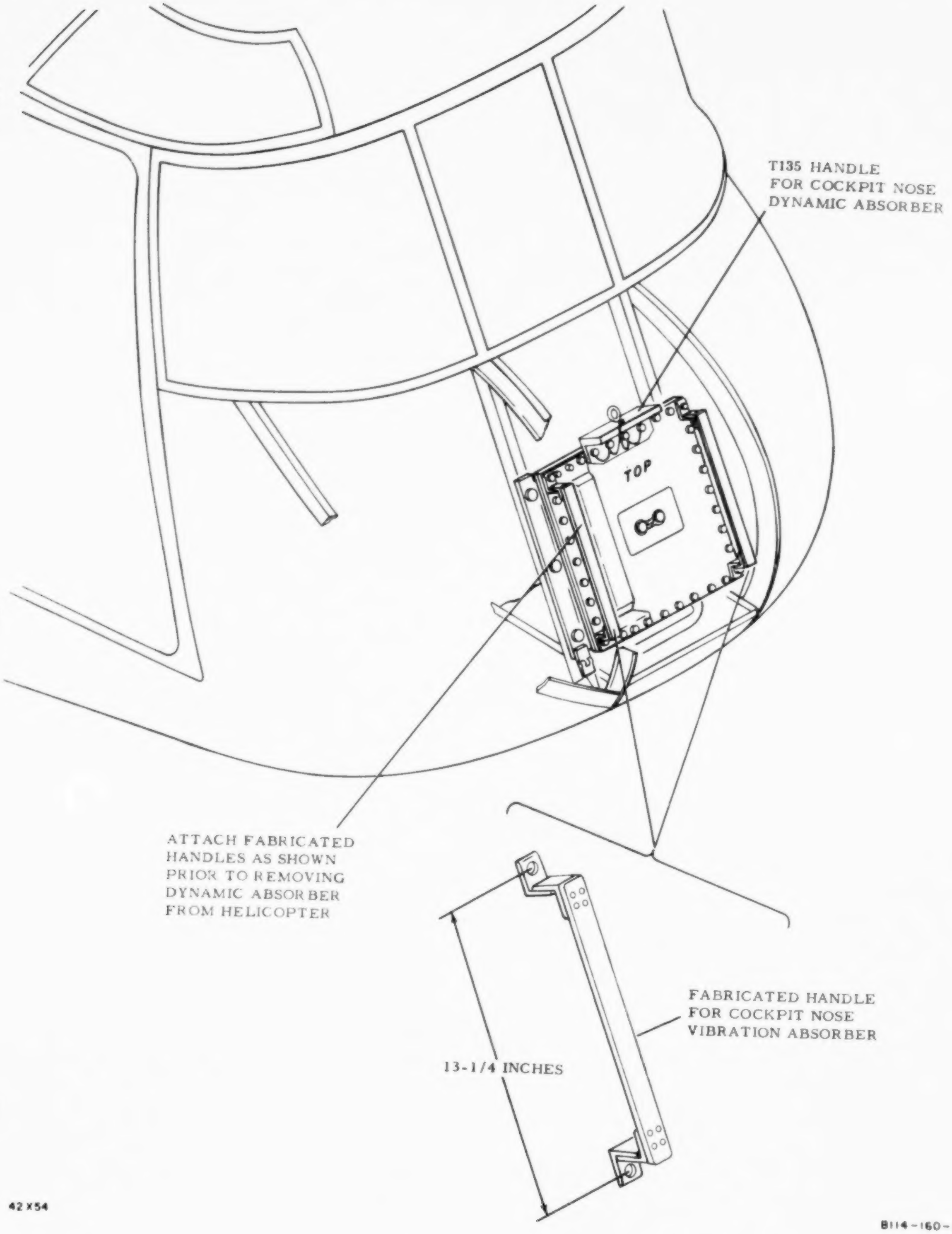
b. Attaching structure for cracks or damage.

2-198. Removal. (See fig. 2-54 and 2-55.) Remove either absorber (4, fig. 2-54) from below pilot's or copilot's seat as follows:

a. Remove pilot's or copilot's jettisonable door. (Refer to para 2-77.)

Table 2-5. Premaintenance Requirements for Cockpit Dynamic Absorber

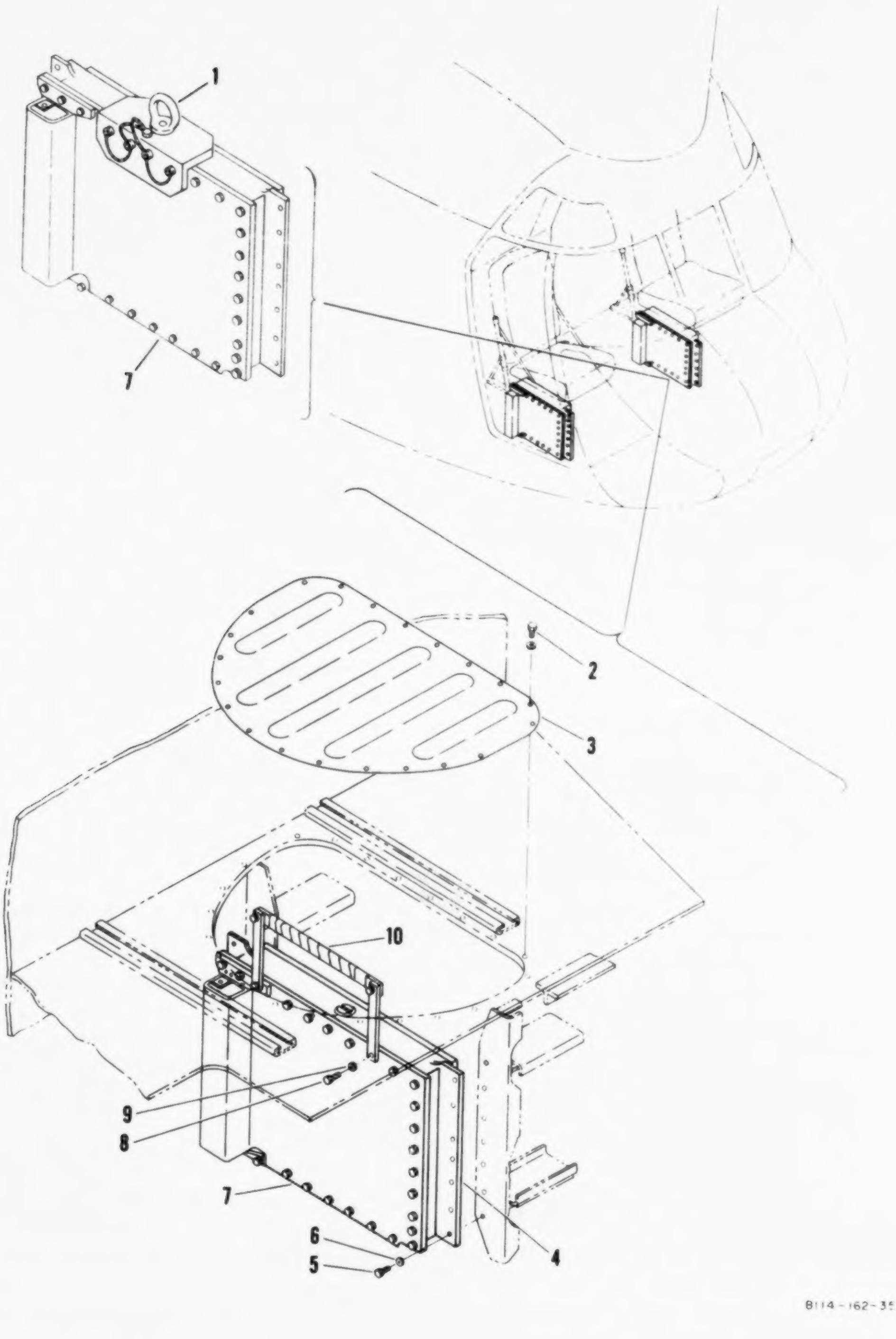
CONDITIONS	REQUIREMENTS
Model	CH-47B
Part No. or Serial No.	All
Special Tools	T135
Test Equipment	None
Support Equipment	300 lb. crane
Minimum Personnel Required	3
Consumable Materials	None
Special Environmental Conditions	None


T135 HANDLE
FOR COCKPIT NOSE
DYNAMIC ABSORBER
TOP
ATTACH FABRICATED
HANDLES AS SHOWN
PRIOR TO REMOVING
DYNAMIC ABSORBER
FROM HELICOPTER
FABRICATED HANDLE
FOR COCKPIT NOSE
VIBRATION ABSORBER
13-1/4 INCHES

42X54

B114-160-35J

Figure 2-53. Nose Dynamic Absorber Handling, CH-47B


1
7
2
3
10
9
8
7
6
5
4
B114-162-35

1. Handling fixture
2. Screw
3. Access panel
4. Absorber
5. Bolt
6. Washer
7. Absorber cover
8. Bolt
9. Washer
10. Fabricated handle

Figure 2-54. Cockpit Dynamic Absorber Installation, CH-47B

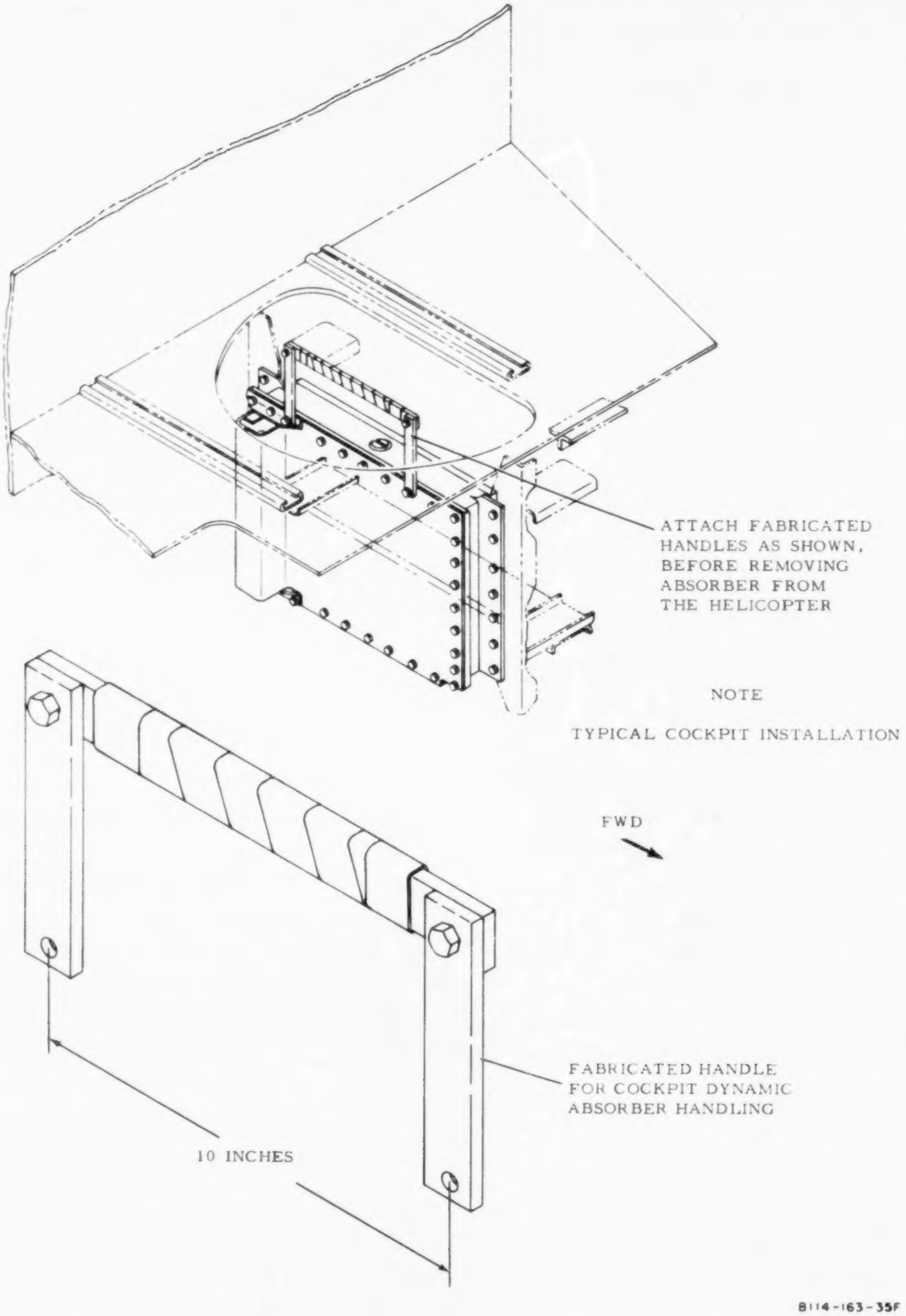

ATTACH FABRICATED HANDLES AS SHOWN, BEFORE REMOVING ABSORBER FROM THE HELICOPTER
NOTE
TYPICAL COCKPIT INSTALLATION
FWD
FABRICATED HANDLE FOR COCKPIT DYNAMIC ABSORBER HANDLING
10 INCHES
B114-163-35F

Figure 2-55. Cockpit Dynamic Absorber Handling, CH-47B

b. Remove pilot's or copilot's seat. (Refer to para 2-157.)

c. Remove pilot's or copilot's seat tracks. (Refer to para 2-157.)

d. Remove screws (2) and absorber access panel (3).

e. Remove two bolts (8) and washers (9) from top of absorber cover (7).

f. (See fig. 2-55.) If absorber handling fixture (T135) is not available, make a handle as follows:

(1) Use aluminum alloy bar 1/8-inch thick by 1-inch wide, or equivalent. Make the handle as shown.

(2) Drill a 5/16-inch diameter hole at each end of handle to fit cover bolts.

g. (See fig. 2-54.) Secure handling fixture (1) or handle (10) to top of absorber cover (7). Use bolts AN3-7A without washers for securing handle.

h. Attach a 300-pound capacity lifting device (crane) to eyebolt of handling fixture or to fabricated handle. Operate lifting device as necessary to partially support weight of absorber (4).

WARNING

Make sure the absorber is adequately supported while mounting bolts are removed. Injury to personnel or damage to helicopter or absorber could result if absorber drops.

i. Support absorber (4). Remove bolts (5) and washers (6) that secure the absorber to mounting brackets.

j. Lift absorber (4) out from below the cockpit floor. Remove it from the helicopter thru the jettisonable door opening. Place the absorber on a clean flat surface.

k. Remove the handling fixture or handle (10) from cover (7). Reinstall bolts (8) with washers.

2-199. Installation. (See fig. 2-54 and 2-55.)

a. Inspect structure in area of absorber. Check for cracks, distortion, corrosion, loose nutplates or rivets.

b. (See fig. 2-54.) Remove bolts (8) and washers (9) from the top of absorber cover (7).

c. Attach the handling fixture (T135) or handle (10) to cover (7). Use two bolts AN3-7A without washers, for attaching the handle.

d. Lift the absorber thru the jettisonable door opening, into the cockpit. Use a 300-pound capacity lifting device (crane).

e. Position the absorber on the mounting brackets below the cockpit floor.

WARNING

Make sure the absorber is adequately supported while mounting bolts are installed. Injury to personnel or damage to helicopter could result if the absorber should drop.

f. Support absorber (4). Install mounting bolts (5) and washers (6).

g. Remove handling fixture (T135) or handle (10) from absorber cover (7). Reinstall bolts (8) and washers (9).

h. Install absorber access panel (3). Secure it with screws (2).

i. Install seat tracks. (Refer to para 2-158.)

j. Install pilot's or copilot's seat. (Refer to para 2-158.)

k. Install jettisonable door. (Refer to para 2-93.)

2-200. Self-Tuning Dynamic Absorber System (CH-47C).

(See fig. 2-56 and 2-57.) Three self-tuning absorbers and a test box are installed in the forward fuselage section. Two absorbers are installed below the cockpit floor. One absorber is installed in the cockpit nose. The test box is installed in the heater compartment. The self-tuning absorbers aid in automatically reducing helicopter rotor-induced vibration.

2-201. Operation.

(See fig. 2-56 and 2-57.) The self-tuning absorber system includes a test box and three tuned absorbers. The test box contains the power supply for the system. It also develops and distributes the test signal. In addition to the mechanical components, each absorber contains an accelerometer, a transducer, an actuator, and a control module.

2-202. Operational Check. Proceed as follows:

a. Connect ac power to the helicopter. (Refer to para 1-97.)

b. Check that the three VIBRATION ABSORBER circuit breakers (LEFT, RIGHT, and CTR) are pushed in.

c. Turn the selector switch on the test box to LEFT.

d. Operate the test switch on the test box to RETRACT. Hold the switch at this position until the meter pointer indicates zero or stabilizes at about zero.

e. Operate and hold the test switch to EXTEND. The meter pointer will move in the EXTEND direction and may initially deflect off-scale. The meter pointer should return to the required average meter deflection and fall to about zero in the required time interval for the ambient temperature. (Refer to table 2-6.)

f. Operate and hold the test switch to RETRACT. The meter pointer will move in the RETRACT direction and may initially deflect off-scale. The meter pointer should return to the required average meter deflection and fall to about zero in the required time interval for the ambient temperature. (Refer to table 2-6.)

g. Turn the selector switch to CENTER. Repeat steps d thru f.

h. Turn the selector switch to RIGHT. Repeat steps d thru f.

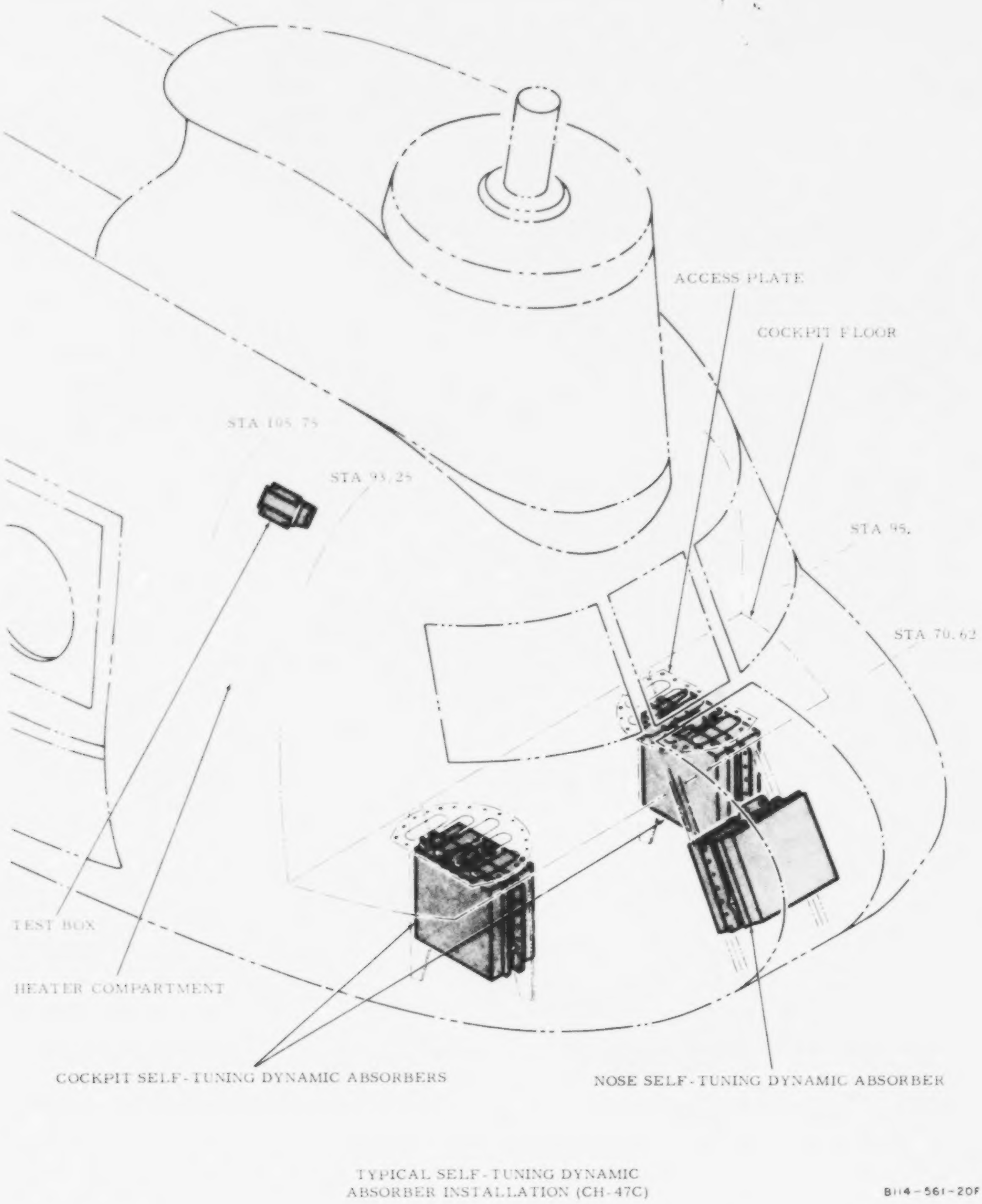
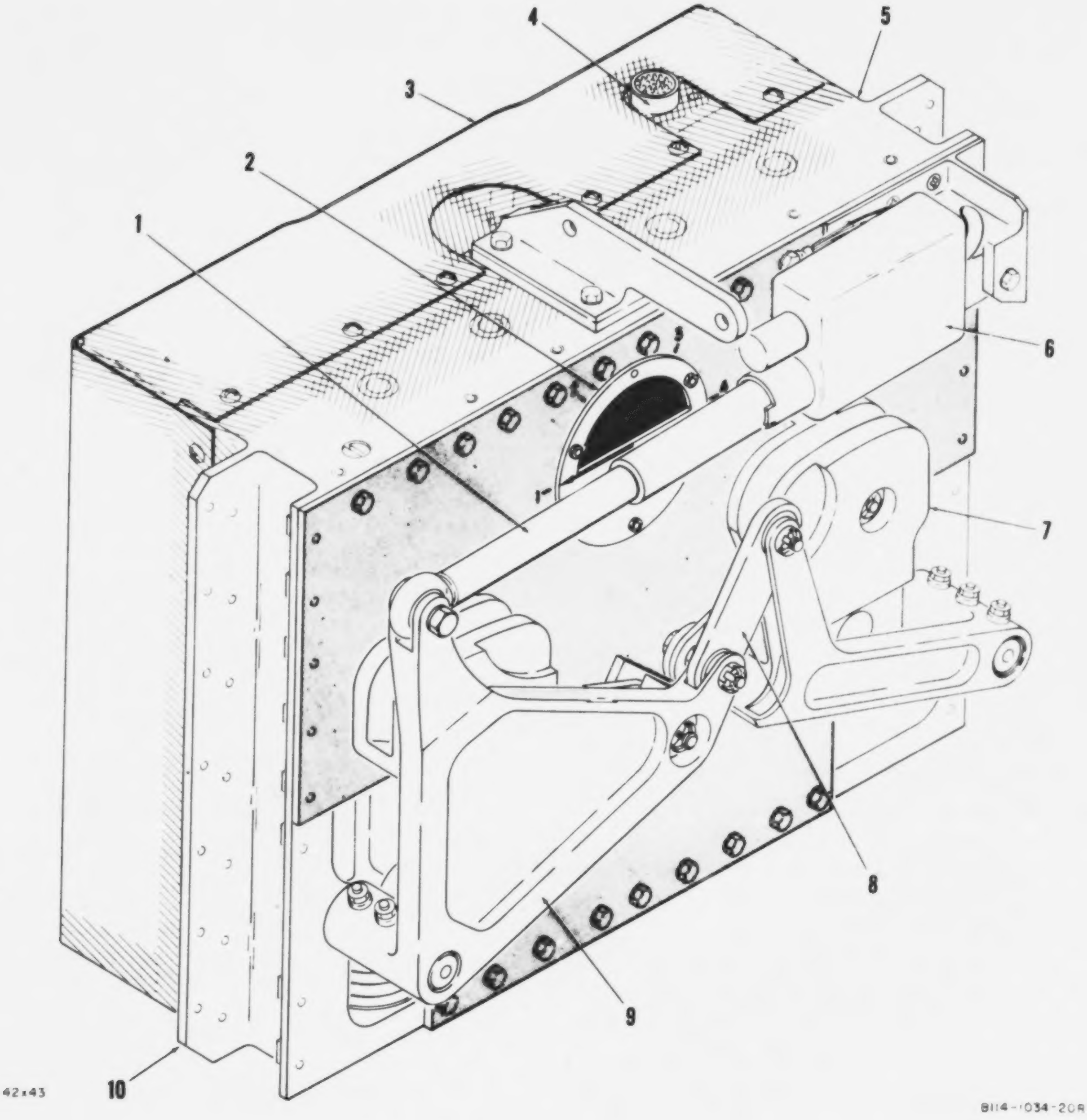
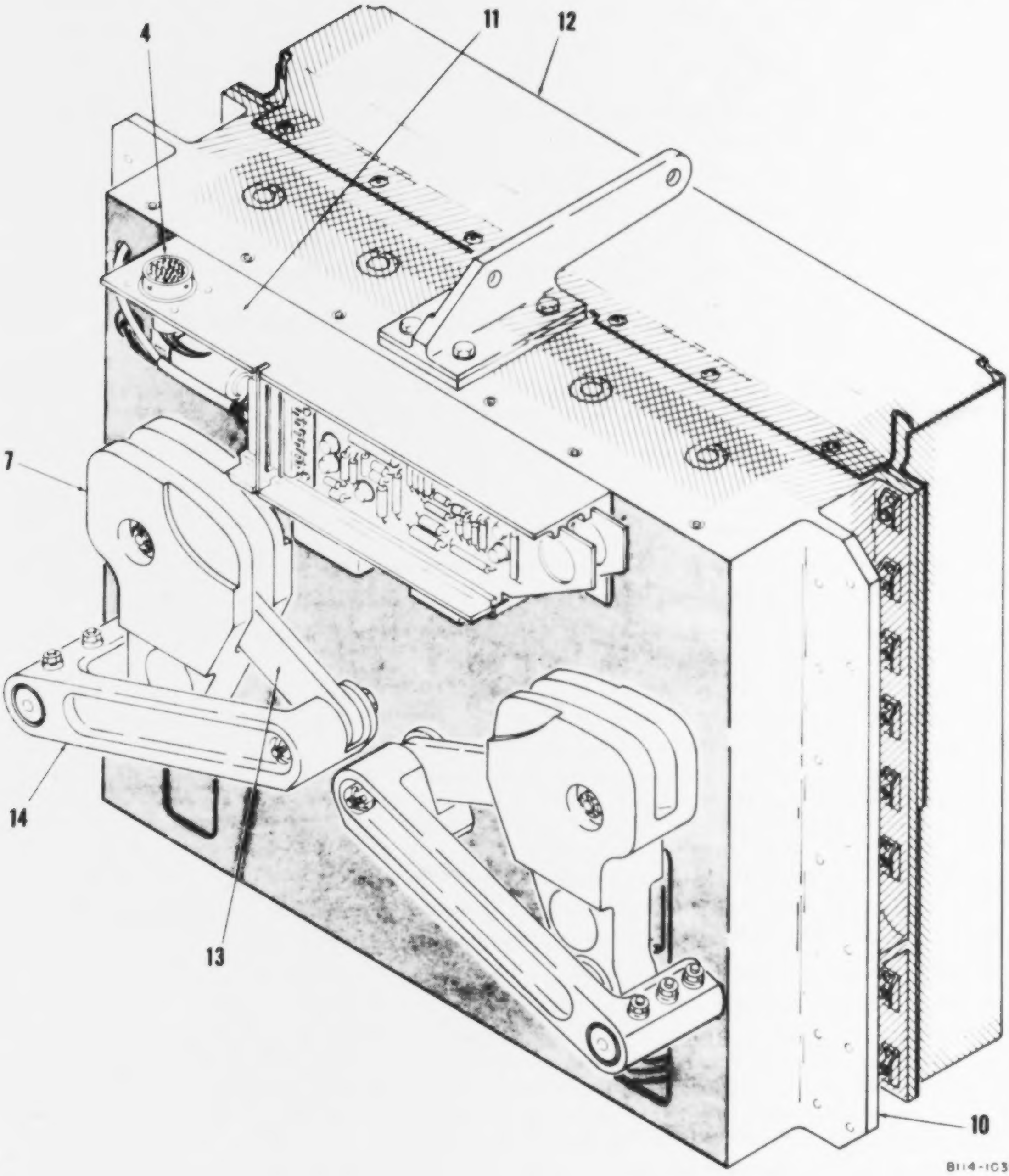

ACCESS PLATE
COCKPIT FLOOR
STA 105.75
STA 93.25
STA 95.
STA 70.62
TEST BOX
HEATER COMPARTMENT
COCKPIT SELF-TUNING DYNAMIC ABSORBERS
NOSE SELF-TUNING DYNAMIC ABSORBER
TYPICAL SELF-TUNING DYNAMIC
ABSORBER INSTALLATION (CH-47C)
B114-561-20F

Figure 2-56. Self-tuning Dynamic Absorber Installation, CH-47C


4
5
3
2
1
6
7
8
9
10
42x43
B114-1034-20R

1. Actuator shaft
2. Vent plate
3. Cover
4. Electrical connector
5. Case
6. Actuator
7. Tuning mass
8. Link
9. Bellcrank
10. Mounting flange
11. Control module
12. Cover
13. Link
14. Lever

Figure 2-57. Self-tuning Dynamic Absorber, CH-47C (Sheet 1 of 2)


4
11
12
7
14
13
10

42x44

B114-IC35-20R

Figure 2-57. Self-tuning Dynamic Absorber, CH-47C (Sheet 2 of 2)

i. Turn the selector switch to OFF. Remove ac power from the helicopter.

Table 2-6. Self-tuning Dynamic Absorber System Operational Check-chart

TEMPERATURE	AVERAGE METER DEFLECTION	TIME INTERVAL IN SECONDS
+50°F (+10°C) and above	.05 to .20	50 to 300
-4°F (-20°C) to +50°F (+10°C)	.04 to .20	50 to 360
-67°F (-55°C) to -4°F (-20°C)	.02 to .20	50 to 480

2-203. Troubleshooting. (Refer to table 2-7.) The trouble indications presented in table 2-7 are as follows:

a. No indication on test box meter when test switch is operated. Selector switch at LEFT, CENTER, or RIGHT.

b. No indication on test box meter at one or two of the three selector switch positions.

c. Excessive three-per-rev helicopter vibration.

d. Flight pattern change vibration compensation slow, intermittent, or stoped.

e. Absorber mass bottoming. (Banging noise.)

2-204. Nose Self-Tuning Dynamic Absorber.

(See fig. 2-56 and 2-57.) One nose self-tuning absorber, weighing about 160 pounds (114S2971-86 — metal blades) or 168 pounds (114S2971-113 — fiberglass blades), is installed forward of the instrument panel.

Table 2-7. Self-Tuning Dynamic Absorber System Troubleshooting

NOTE

Before you use this table, be sure you have performed all normal operational checks, and that vibration absorber circuit breakers (identified on the panel as LEFT, CENTER, RIGHT) are closed.

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. No indication on test box meter when test switch is operated. Selector switch at LEFT, CENTER, or RIGHT.

STEP 1. Check for defective wiring between the circuit breaker and test box or a defective test box.

Unplug cable connector from the test box. Check between cable connector terminals A and a, B and b, C and c, for 115 vac. If voltage is not present, repair the wiring.

STEP 2. If voltage is present replace test box. (Refer to para 2-214 and 2-215.)

2. No indication on test box meter at one or two of the three selector switch position.

STEP 1. Check for defective absorber by checking wiring voltages.

Unplug cable connector from absorber. Check helicopter wiring voltages. There should be 115 Vac at pin B, 13 Vac at pin V, +18 Vdc at pin H, -18 Vdc at pin G, and test signal voltages at pins J and E with the test switch operated. If voltage is present replace the absorber. (Refer to para 2-206 and 2-207 or 2-210 and 2-211.) If voltage is not present proceed to Step 2.

STEP 2. Check for defective wiring or defective test box.

Unplug the test box. Check continuity between test box and absorber. If no continuity is indicated, repair the wiring. If continuity exists, replace the test box. (Refer to para 2-214 and 2-215.)

3. Excessive three-per-rev helicopter vibration.

STEP 1. Check for vibration absorber operation.

Perform the operational check in para 2-202. Replace the absorber or repair wiring to the absorber if the test box indicates defective. If the test box indicates the absorbers are okay, replace the appropriate absorber for the particular area of vibration, that is, if the vibration is felt by the pilot, replace the pilot's absorber. If the vibration is felt by the co-pilot, replace the co-pilot's absorber. If vibration is felt by both, replace the nose absorber. (Refer to para 2-206 and 2-207 or 2-210 and 2-211.)

If the test box indications are not as specified in table 2-6, troubleshoot symptom NO INDICATION ON TEST BOX METER WHEN TEST SWITCH IS OPERATED.

4. Flight pattern change vibration compensation, slow, intermittent, or stopped.

STEP 1. Refer to malfunction 3 above and perform checks as indicated.

5. Absorber mass bottoming.

STEP 1. Check for weak or broken springs.

Replace the absorber. (Refer to para 2-206 and 2-207 or 2-210 and 2-211.)

panel at about sta 30. It is mounted to the windshield posts. Each post extends from the nose to the forward transmission support structure. At the structure, each post is attached to an isolator mount which is fastened to the structure. The absorber reduces vibration in the forward structure of the helicopter. It is accessible thru the nose access door.

2-205. Inspection of Nose Self-Tuning Absorber. Inspect for the following conditions:

a. Security of absorber mounting hardware.

b. Attaching structure for cracks or damage.

c. Security and condition of electrical connector and wiring.

d. (See fig. 2-50.) Isolator mounts for general condition.

2-206. Removal of Nose Self-Tuning Dynamic Absorber. (See fig. 2-58.) Refer to table 2-8 for premaintenance requirements for the nose self-tuning dynamic absorber.

NOTE

The absorber weighs about 160 pounds (114S2971-86 — metal blades) or 168 pounds (114S2971-113 — fiberglass blades).

a. Remove nose compartment access door as follows:

(1) Release latch, open nose access door (1), and support it with brace (20).

(2) Remove screw (5), washers (4), nuts (10), and bonding jumper (3) from structure. Remove screw (9), washer (8), and strap (2) from access door.

(3) Release access door brace (20). Lower the access door.

(4) Remove screws (6), washers (7), and nose access door (1) from the helicopter.

b. Obtain an overhead lifting device (crane) capable of lifting 300 pounds.

c. Attach the crane hook to the hole nearest the forward end of bracket (19). Take up slack on the cable.

d. Disconnect electrical connector (11) from the absorber.

WARNING

Make sure the absorber is adequately supported while mounting bolts are being removed. Injury to personnel or damage to helicopter or absorber could result if the absorber drops.

e. Remove bolts (18) and washers (17).

f. Carefully lift absorber (12) from the nose access compartment. Make sure the absorber does not hit the sides of the nose compartment.

CAUTION

The mounting flanges of the absorber must rest on supports. The weight of the absorber on absorber covers can damage covers.

g. Secure the absorber to a handling adapter mounted on a transportation trailer. If a handling adapter (T140) is not available, lower the absorber onto two supports (14). (See fig. 2-58.)

h. Disconnect crane from bracket.

2-206.1 Absorber Configuration Conversion. (See fig. 2-57.) All self-tuning absorbers are identical except for the position of internal damping adjustment. Absorbers with the internal damping adjustment set at No. 1 are for cockpit floor installation. Absorbers with the internal damping adjustment set at No. 3 are for nose installation. Convert an absorber as necessary to install it in the required location, as follows:

a. Remove absorber cover as follows:

(1) Place absorber on a suitable work bench. Position it upright or horizontal with the weight supported by its mounting flanges.

(2) Loosen the sealing tape by saturating it with methyl-ethyl-ketone (C216).

(3) Remove the sealing tape from the absorber.

(4) Remove the cover attaching screws, bolts, and washers.

b. Remove the three nuts securing the vent plate to the case.

c. If converting from a cockpit to a nose absorber, rotate the ventplate from No. 1 position to No. 3 position.

d. If converting from a nose to a cockpit absorber, rotate the ventplate from No. 3 position to No. 1 position.

e. Secure the ventplate to the case with the nuts removed in step b.

f. Stencil a new position number and current date in the space provided on the absorber cover. Use 1/4-inch high letters and black enamel (C139).

g. Install the absorber cover as follows:

(1) Align the arrow on the ventplate with the number on the cover plate corresponding to the damping position number stamped on the cover.

(2) Install the covers on the case. Secure them with the attaching hardware.

(3) Clean surface of case and covers. Use methyl-ethyl-ketone (C216).

(4) Mark off those areas of the absorber where tape is to be applied. The tape shall extend a minimum of 1/2-inch beyond the opening to be sealed.

(5) Cut tape strips to match the marked off areas. Use tape (C333).

(6) Position the cut tape on the marked areas. Attach one end of tape to the absorber. Use masking tape (C337) or equivalent.

(7) Remove the paper back from approximately 2 inches of the free end of the tape. Moisten the uncovered tape with a felt applicator, or equivalent, moist with activator (C18).

NOTE

To ensure a good bond, apply the tape to the absorber while it is moist with activator.

(8) Firmly press activated tape in position on the absorber. Prevent air bubbles between tape and absorber.

(9) Remove the masking tape. Repeat steps (7) and (8) to complete the tape installation.

2-207 Installation of Nose Absorber. (See fig. 2-58.)

NOTE

Before an absorber is installed, the absorber electrical components can be functionally checked, if desired, using helicopter electrical power. Connect the absorber to the helicopter absorber system. Use test harness (T49). Perform an operational check. (Refer to para 2-202.)

a. Inspect absorber mounting structure for cracks and damage. Check for loose or missing rivets and loose barrel nuts.

CAUTION

Dynamic absorber (114S2971-113) used in helicopters fitted with fiberglass rotor blades is different from those used for helicopters with metal blades. Do not interchange dynamic absorbers.

b. Select an absorber with internal damping adjustment set at the No. 3 position or remove cover and set dampener at the No. 3 position. (Refer to para 2-206.1.)

NOTE

The internal damping adjustment position is stenciled on the absorber cover.

c. Using an overhead lifting device (crane), attach hook to the hole and at the end of the handle on bracket (19).

WARNING

Make sure the absorber is adequately supported while placing it in the nose compartment. Injury to personnel or damage to helicopter or absorber could result if the absorber should drop.

d. Lift absorber (12). Carefully move it into the nose access compartment.

e. Set the absorber on two bolts (16) so the absorber rests against support structure. Align bolt holes in absorber and support structure by raising or lowering bolts.

f. Install mounting bolts (18) and washers (17). Back bolts (16) down to stop (15).

g. Disconnect crane hook from bracket.

h. Connect electrical connector (11) to vibration absorber (12).

i. Install nose compartment access door (1) as follows:

(1) Place nose access door (1) over nose compartment opening. Secure door to helicopter with screws (6) and washers (7).

(2) Attach bonding jumper (3) to structure with screw (5), washer (4), and nut (10).

(3) Attach strap (2) to access door with screw (9) and washer (8).

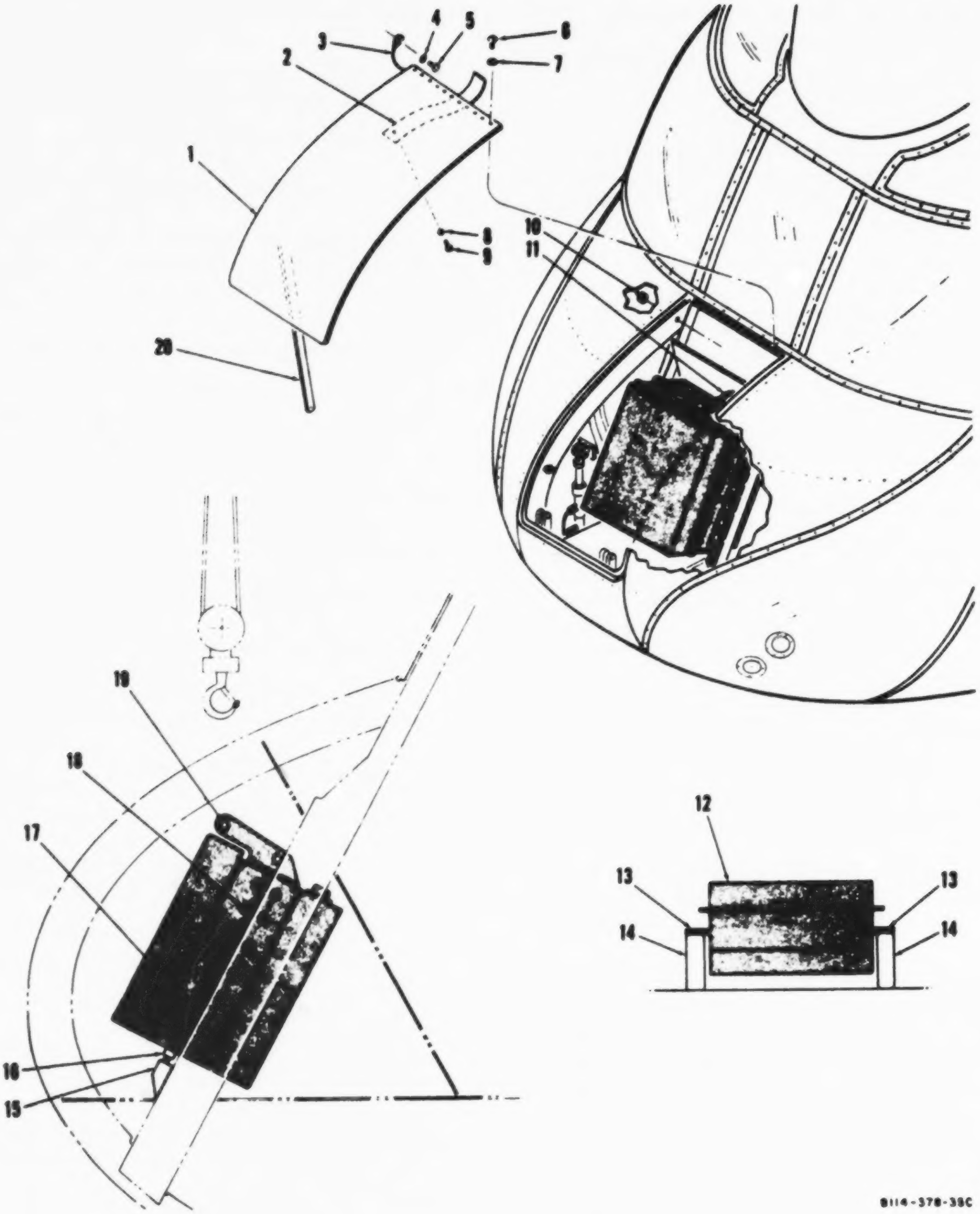
(4) Close nose compartment access door.

2-208. Cockpit Self-Tuning Dynamic Absorbers.

(See fig. 2-56 and 2-59.) There are two self-tuning dynamic absorbers, weighing about 160 pounds (metal blades) or 168 pounds (fiberglass blades) each, mounted in the cockpit. They are installed between sta 70.62 and 95 under the cockpit floor. Both absorbers are mounted in a vertical axis, one below the pilot's seat and the other below the copilot's seat. An access plate under each seat permits access to the area of the absorbers for removal. The cockpit absorbers are similar to the nose absorber.

Table 2-8. Premaintenance Requirements for Nose Self-tuning Dynamic Absorber

CONDITIONS	REQUIREMENTS
Model	CH-47C
Part No or Serial No	All
Special Tools	T140
Test Equipment	None
Support Equipment	300 lb crane, transportation trailer 100334
Minimum Personnel Required	3
Consumable Materials	None
Special Environmental Conditions	None


3
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1
8
9
10
11
20
19
18
17
16
15
12
13
13
14
14
B114-378-38C

1. Nose access door
2. Strap
3. Bonding jumper
4. Washer
5. Screw
6. Screw
7. Washer
8. Washer
9. Screw
10. Nut
11. Connector
12. Self-tuning absorber
13. Mounting flange
14. Support
15. Stop
16. Bolt
17. Washer
18. Bolt
19. Bracket
20. Brace

Figure 2-58. Nose Self-Tuning Absorber Installation, CH-47C

2-209. Inspection of Cockpit Self-Tuning Absorber. Inspect for the following conditions:

a. Security of absorber mounting hardware.

b. Attaching structure for cracks or damage.

c. Security and condition of electrical connector and wiring.

d. Isolator mounts for general condition.

2-210. Removal of Cockpit Self-Turning Dynamic Absorbers. (See fig. 2-59.) Remove either self-tuning absorber (8) from below the pilot's or copilot's seat as follows:

Refer to table 2-9 for premaintenance requirements.

NOTE

The absorber weighs about 160 pounds (metal blades) or 168 pounds (fiberglass blades).

a. Remove pilot's or copilot's jettisonable door. (Refer to para 2-82.)

b. Remove pilot's or copilot's seat. (Refer to para 2-157.)

c. Remove screws (1), washers (2), and absorber access panel (3).

d. Disconnect electrical connector (5) from absorber (8).

e. Attach a lifting device (crane) capable of lifting 300 pounds, to the hole nearest the absorber in bracket (4).

WARNING

Make sure the absorber is adequately supported while mounting bolts are being removed. Injury to personnel or damage to helicopter or absorber could result if the absorber drops.

f. Support the absorber with the lifting device. Remove bolts (7) and washers (6).

WARNING

Handle the absorber with care. Injury to personnel or damage to absorber and helicopter could result if the absorber drops.

g. Lift absorber up thru the cockpit floor access opening. Remove it from helicopter.

CAUTION

The mounting flanges of absorber must rest on the supports. The weight of absorber on absorber covers can damage covers.

h. Secure the absorber to a handling adapter (T140) mounted on a transportation trailer. If a handling adapter is not available, lower the absorber onto two supports (9). (See fig. 2-59.)

i. Disconnect crane from bracket.

2-211. Installation of Cockpit Absorber. (See fig. 2-59.) Install either self-tuning absorber (8) below the pilot's or copilot's seat as follows:

CAUTION

Weight on the absorber covers will damage the covers. The absorber mounting flanges must support the weight of the absorber.

NOTE

Before installing an absorber, the absorber electrical components can be functionally checked, if desired, using helicopter electrical power. Connect the absorber to the helicopter absorber system. Use test harness T149. Perform an operational check. (Refer to para 2-202.)

a. Inspect absorber mounting structure for cracks, damage, loose or missing rivets, and loose barrel nuts.

CAUTION

The dynamic absorbers (114S2971-113) used in helicopters fitted with fiberglass rotor blades are different from those used for helicopters with metal blades. Do not interchange dynamic absorbers.

b. Select an absorber with the internal damping adjustment set at No. 1 position or remove cover and set dampener at the No. 1 position. (Refer to para 2-206.1.)

NOTE

The internal damping adjustment position is stenciled on absorber cover.

c. Attach a lifting device with a rope or cable sling, capable of lifting 300 pounds, to the aft hole in bracket (4).

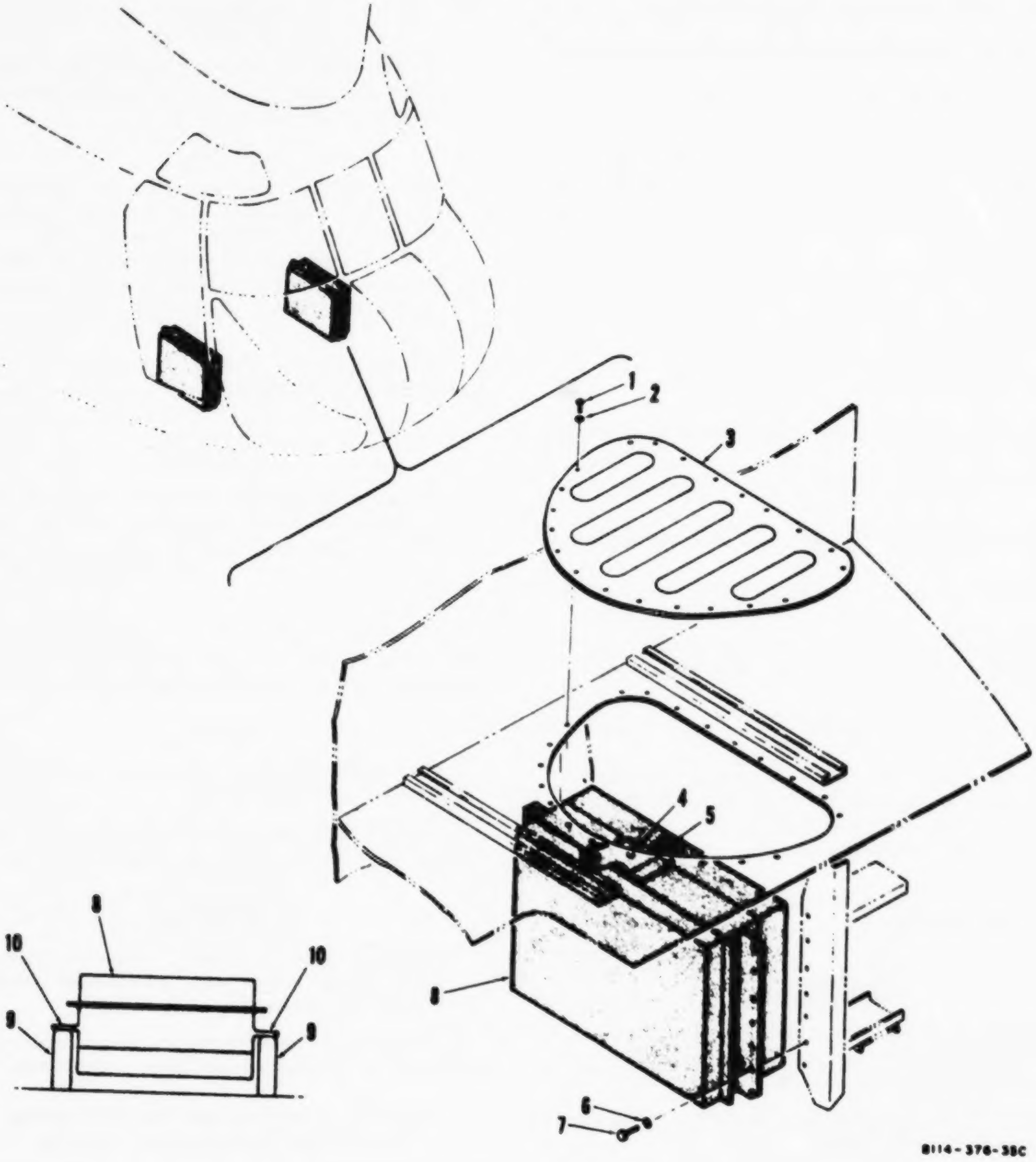
WARNING

Handle the absorber carefully. Injury to personnel or damage to helicopter and absorber could occur if absorber drops.

d. Position and carefully lower the absorber thru the access hole to its installed position below cockpit floor.

Table 2-9. Premaintenance Requirements for Cockpit Self-Tuning Dynamic Absorber

CONDITIONS	REQUIREMENTS
Model	CH-47C
Part No. or Serial No.	All
Special Tools	T140
Test Equipment	T149
Support Equipment	Transportation trailer, 300 lb. crane
Minimum Personnel Required	3
Consumable Materials	None
Special Environmental Conditions	None


1
2
3
4
5
8
10
10
9
9
8
6
7
8114-376-38C

1. Screw
2. Washer
3. Access panel
4. Bracket
5. Connector
6. Washer
7. Bolt
8. Self-tuning absorber
9. Support
10. Mounting flange

Figure 2-59. Cockpit Self-Tuning Dynamic Absorber, CH-47C

WARNING

Make sure the absorber is adequately supported while mounting bolts are installed. Injury to personnel or damage to helicopter could result if the absorber should drop.

e. Secure the absorber. Use bolts (7) and washers (6).

f. Disconnect rope or cable from absorber bracket.

g. Connect cable plug to connector (5).

h. Install access panel (3). Use screws (1) and washers (2).

i. Install the pilot's or copilot's seat. (Refer to para 2-158.)

j. Install the jettisonable door. (Refer to para 2-93.)

2-212. *Test Box.*

The test box is installed in the heater compartment forward of sta 120 on the crown frame. It provides an integral testing capability for the self-tuning dynamic absorbers. The test box contains power supply, test signal, and switching circuits.

2-213. *Inspection of Test Box.* Inspect for the following conditions:

a. Security of mounting.

b. Security of electrical connector.

2-214. *Removal.* (See fig. 2-60.)

a. Unplug the electrical connector (4) from the test box (1).

b. Remove the four screws (2) and washers (3).

c. Remove the test box (1) from the structure.

2-215. *Installation.* (See fig. 2-60.)

a. Position the test box (1) on the structure in the heater compartment (5).

b. Secure the test box with the screws (2) and washers (3).

c. Connect the electrical connector (4) to the test box.

2-216. Cabin Fuselage Structure Assembly.

This assembly is spliced at manufacture with the cockpit fuselage structure assembly and extends from sta 160 to 440. This assembly includes, in addition to the basic structure, a longitudinal hinge which attaches the pod, support structure for the drive shafting, cargo hook, litter straps, flooring, heater ducts, and backing boards. Watertight flotation sealing must be maintained at wl 0 and below. Weathertight sealing is required above wl 0. Refer to para 2-544 for fuselage sealing requirements.

2-217. Cabin Access Doors, Covers, Panels And Fairings.

(See fig. 2-2.) The access provisions in the forward cabin section, in addition to those provisions in the floor, consist of a nose compartment access door (9), two forward pylon work platforms (8), and a forward interphone jack access door (10) on the right side of the fuselage.

a. The access provisions in the cabin fuselage section consist of six cabin crown access tunnel covers (7) for access to the drive shafting, and external power receptacle access door (38) in the fairing forward of the forward left pod, an electrical compartment access panel (37) in the forward fairing of each pod, two forward landing gear access panels (13), two forward fuel boost pump access panels (12), two center pod access panels (16), two aft fuel boost pump access panels (15), two aft pod access panels (17), and two maintenance crane installation panels (6). Three panels on the right side of the helicopter open to provide foldout steps (11).

b. The access provisions in the aft cabin section consist of two aft landing gear access panels (19), two aft landing gear fairings (20), an apu emergency fluid shutoff access door (36), and an aft interphone jack and ramp control access door (18). Work platforms (21) in both pods make engine maintenance easier.

c. The access provisions in the pylon consist of the pylon leading edge hinged fairing (3), an aft transmission oil filler access door (35), two vibration absorber access panels (2 and 30), two aft transmission access covers (26 and 34), a blower inspection access cover (24), a utility hydraulic pump access panel (33), and four pylon removal access panels (1 and 31). Work platforms (25 and 32) make maintenance on the aft rotary wings and flight controls easier.

d. The engine covers consist of a three-section (upper cowl and left and right cowls) upper cover (23), and a one-piece (lower cowling panel) lower access door (22). An engine oil quantity indicator access door (28) and an engine oil filler access door (29) are located on the 3-section cover.

e. The upper and lower hinged access panels (4 and 5) in the driveshaft and gearbox fairing provide access for maintenance and inspection of the driveshaft-to-engine gearbox coupling.

f. The electrical compartment door consists of two skins and a stiffener formed from aluminum alloy, and a support, made from an extrusion. The landing gear access panel (See fig. 2-63, sheet 8) is of sandwich honeycomb construction, made in three sections, and is hinged. A typical section of the honeycomb contains an inner and outer skin made of aluminum alloy and a core of MIL-C-7438. Brackets, for hinge attachments, are made of aluminum alloy formed sheet and extruded sections. The fuel pump access panel (See fig. 2-63, sheet 9) is sandwich-honeycomb construction, containing an inner and outer skin made of aluminum alloy and a core MIL-C-7438. The ac-dc receptacle access panel (See fig. 2-63, sheet 9) is made from 2024-T4 clad aluminum alloy and has a snap-latch and hinges made of extruded sections.

2-218. *Inspection of Access Doors, Panels, and Fairings.*

Inspect for the following conditions:

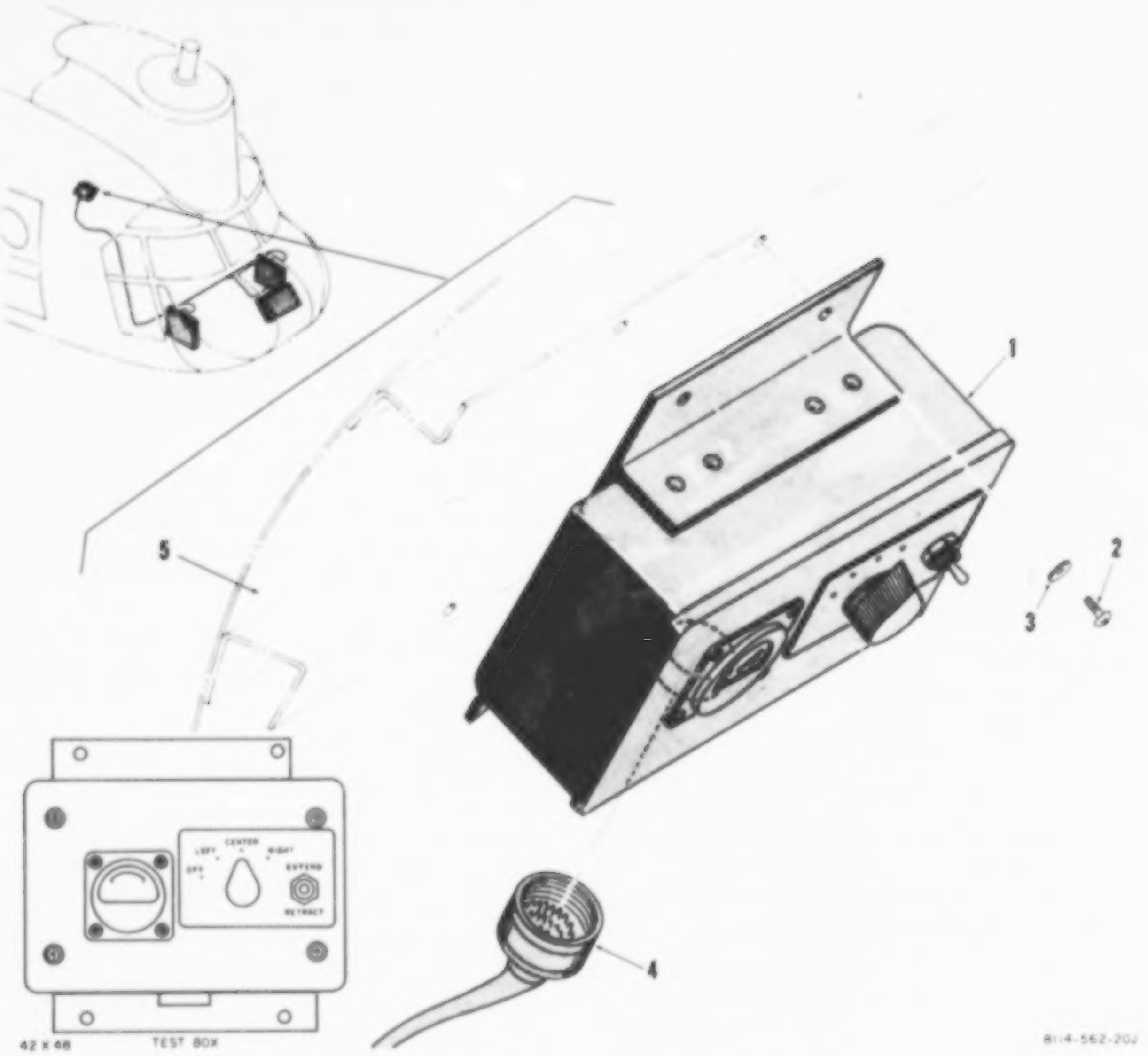
a. Damaged and kinked or frayed cables.

b. Attachment fittings for distortion.

c. Seals for deterioration and security.

d. Fiberglass for cracks, distortion, and separation of laminations.

e. Fasteners and latches for security.


1
2
3
4
5
LEFT
CENTER
RIGHT
OFF
EXTEND
RETRACT
42 x 48
TEST BOX
81-4-562-20J

1. Test box
2. Screw
3. Washer
4. Electrical connector
5. Heater compartment

Figure 2-60. Self-Tuning Dynamic Absorber Test Box

f. Latchpins and receptacles for wear, positive engagement and locking.

g. Oil cooler air screen for obstructions.

h. Fairings, work platforms, covers (cowling), access doors, and panels for positive locking and closure.

i. Exterior skin for cracks, dents, distortion, corrosion, loose or missing rivets, paint scratches, and illegible decals and stencils.

j. No. 1 and No. 2 engine transmission drive shaft fairings for dents, cracks, distortion, and evidence of interference with drive shafting.

2-219. Cabin Crown Access Tunnel Covers.

(See fig. 2-61.) There are six removable tunnel covers on the cabin crown for access to the drive shafting. Unmodified helicopters have covers 114S2905 series made of fiberglass skin. Modified helicopters have covers 114S2915 series made of honeycomb. Turnlock fasteners secure the covers to the fuselage. The top of the tunnel covers are painted with high visibility white paint. The sides of the covers are painted olive drab. Both end tunnel covers have a walkway coating. A formation light is installed on the first tunnel cover. When complete removal is not required, the first, third, and fifth covers may be hinged up and held by integral struts. The second and fourth covers may be hinged up and held to the strut supported covers by integral straps. There are no holding provisions for the remaining small cover.

2-220. Inspection of Covers. Inspect for the following conditions:

a. Covers for cracks and damage.

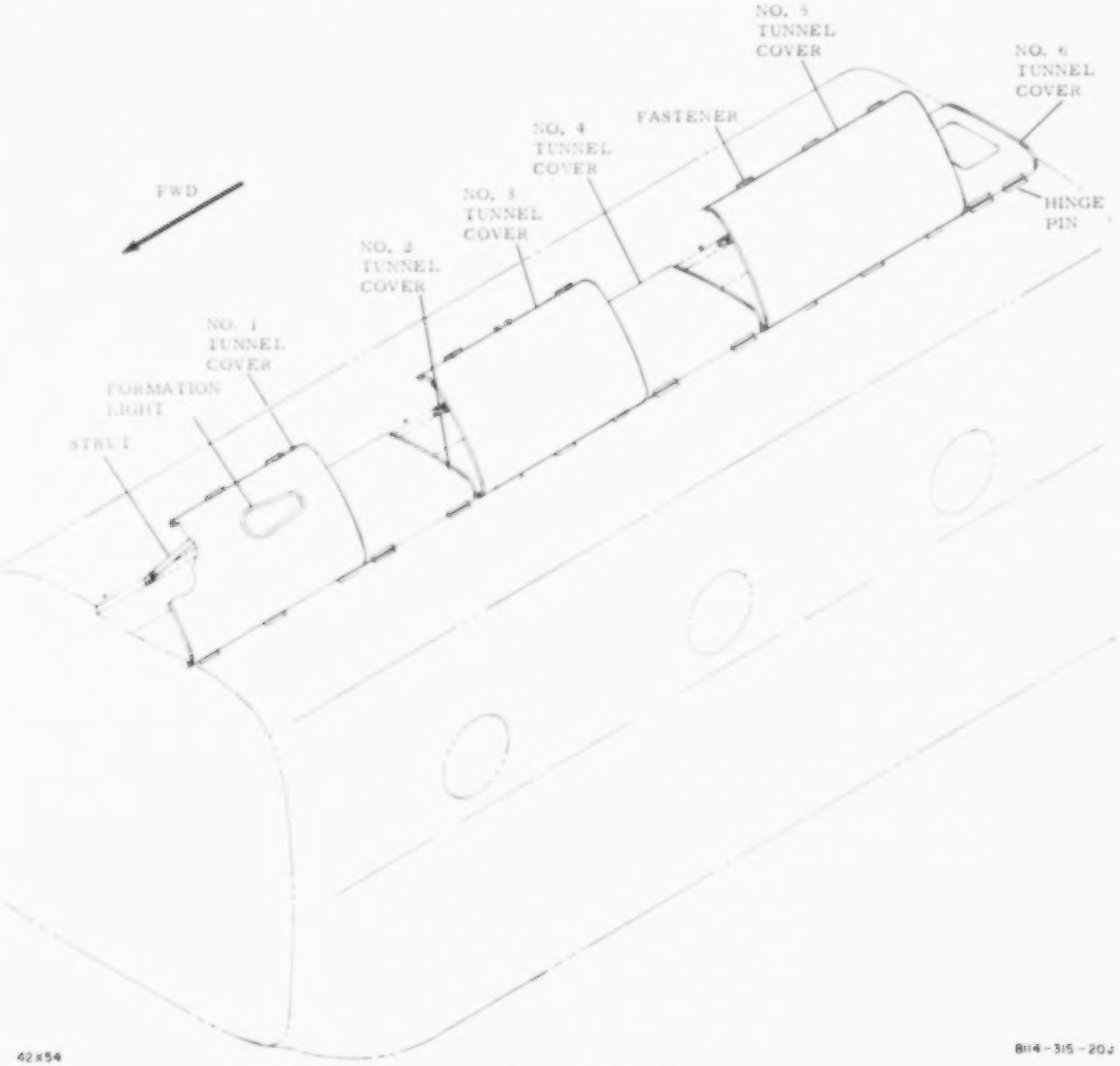


Figure 2-61. Removal of Fiberglass Cabin Crown Access Covers

b. Latches for security.

c. Hinges and hinge pins for security.

d. Tunnel cover support brackets and rods for damage.

e. Seals for damage and deterioration.

2-221. *Removal*. (See fig. 2-61 and 2-62.)

a. Turn the turnlock fasteners and open the tunnel cover.

b. Remove the cotter pin, nut, washer, and bolt from the support strut at the tunnel cover.

c. Remove the hinge pins and tunnel cover from the helicopter.

d. When removing No. 1 tunnel cover, disconnect the formation light. (Refer to para 9-271.)

2-222. *Repair*. (See fig. 2-63.)

a. Damage to formed metal parts, not affecting a radius can be repaired by patching. Tunnel cover hinge pins which are loose and backing out of the hinge, or which have been removed, should be replaced with new hinge pins using the configuration shown in fig. 2-63, sheet 6. Fabricate new hinge pins from headless hinge pin MS20253-2-740. Repair cracks in specific areas of tunnel covers 114S2905 series, as follows:

(1) Remove existing rivets from each tunnel cover.

(2) Repair impregnated glass cloth parts. Refer to TM 55-1500-204-25/1 and TB 746-93-2.

(3) Fabricate and contour gussets for each tunnel cover.

(4) Back drill holes to pick up existing rivet locations, add new rivet hole locations, and deburr holes.

(5) Bond gussets to covers so that rivet holes are aligned. Refer to para 2-550.

(6) Rivet gussets to covers.

(7) Refinish after repair. Refer to para 2-622.

(8) Repair tunnel cover pans by installing ten rivets USAF461-4-6 in the flange of the pan and inner skin. See fig. 2-63, sheet 7.

NOTE

If the pan has four tacking rivets installed in the corners, do not remove them to install the USAF461-4-6 rivets. Do not install USAF rivets in the corners where the tacking rivets are installed.

(9) Install four BACR15DP4AD rivets in the recess of the pan and thru the outer skin of the cover. Install manufactured head on the far side.

b. (AVIM.) Repair damage to formed metal parts affecting a radius by insertion.

2-223. *Installation*. (See fig. 2-61 and 2-62.)

a. Place the tunnel cover in position on the helicopter.

NOTE

Fiberglass tunnel covers 114S2905 series and honeycomb tunnel covers 114S2915 series are not interchangeable.

b. Insert the hinge pins thru the hinge halves on the cover and the hinge halves on the helicopter. Secure pin. Use lockwire (C203). (See fig. 2-63, sheet 6.)

c. Install the bolt, washer, and nut that secure the support strut to the tunnel cover.

d. Fold the strut toward the center of tunnel cover when the cover is closed; then, secure the nut with a cotter pin.

e. If No. 1 tunnel cover is being installed, connect the wire for the formation light. (Refer to para 9-272.)

f. Secure the cover with the turnlock fasteners.

2-224. *Cabin Crown Walkway*.

The walkway panels consist of rigidized aluminum alloy panels bonded to a sandwich honeycomb structure. (See fig. 2-64.) The panels are fully coated with black walkway material. The panels are installed on the right side of the cabin crown from approximately bl 10 to bl 26. They run from sta 160 thru sta 440.

2-225. *Inspection*. Check that nicks and scratches after burnishing do not exceed 10 percent of the material thickness. See fig. 2-6 for limits of small holes and stop drilled cracks.

2-226. *Repair*. (See fig. 2-64.) Temporarily patch or fill stop-drilled cracks and small holes, $\frac{5}{16}$ inch or less in diameter, with a type A rivet. All patches and rivet installations shall be sealed weathertight. Extensive damage, such as loss of major portion of a panel or numerous isolated damages, requires replacement of the walkway panel assembly. Maintain weathertight integrity. Refer to para 2-544. Apply black walkway material (C377). Material shall contain 50 mesh walnut shell aggregate. Refer to para 2-626 for walkway material application.

2-227. *Pod-to-Fuselage Fairing*

The pod-to-fuselage fairing consists of fairings made of polyester-impregnated glass cloth. The fairing skin section between sta 482 and 520 is made of 0.030-inch thick 2024-T4 clad aluminum alloy. Each fairing is reinforced at each end with an additional one or two layers of glass cloth. Retainers, made of three plies of polyester-impregnated glass cloth, are attached to the pod at approximately wl −2. The retainers secure the bottom edge of the fairings. Seals, made from silicone sponge rubber, are cemented to the top edge of each section.

2-228. *Inspection*. Check for damage to the impregnated glass cloth parts such as small voids, small wrinkles, and small cracks which can be stop-drilled. Also, damage to metal parts which can be permitted to exist as is, or can be corrected by a simple procedure, such as the stop-drilling of small cracks, burnishing of nicks and scratches, and the removal of small dents and damaged areas is considered negligible. See fig. 2-3.

2-229. Repair. (See fig. 2-64.)

a. Damage to formed metal parts not affecting a radius can be repaired by patching.

b. (AVIM.) Damage to formed metal parts affecting a radius should be repaired by insertion. Extensive damage, such as the loss of a major portion of a fairing retainer or seal, or numerous isolated damages which cannot be repaired by patching or insertion, necessitates replacement.

2-230. Fuselage Foldout Steps, Recessed Grips, and Handgrip.

(See fig. 2-65.) Three foldout steps, ten recessed steps, and a handgrip are installed on the right side of the helicopter. They permit maintenance personnel to climb to the top of the helicopter fuselage.

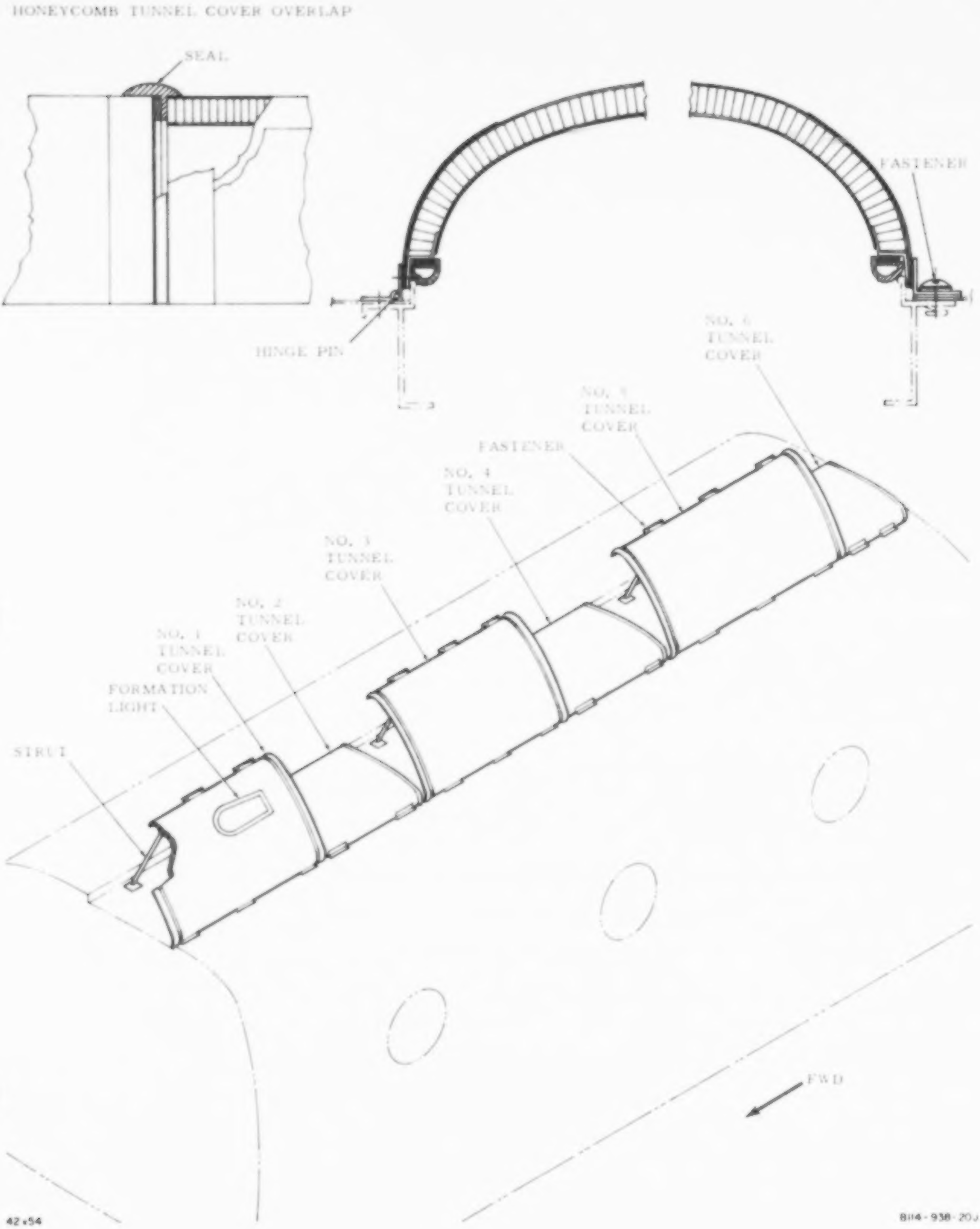
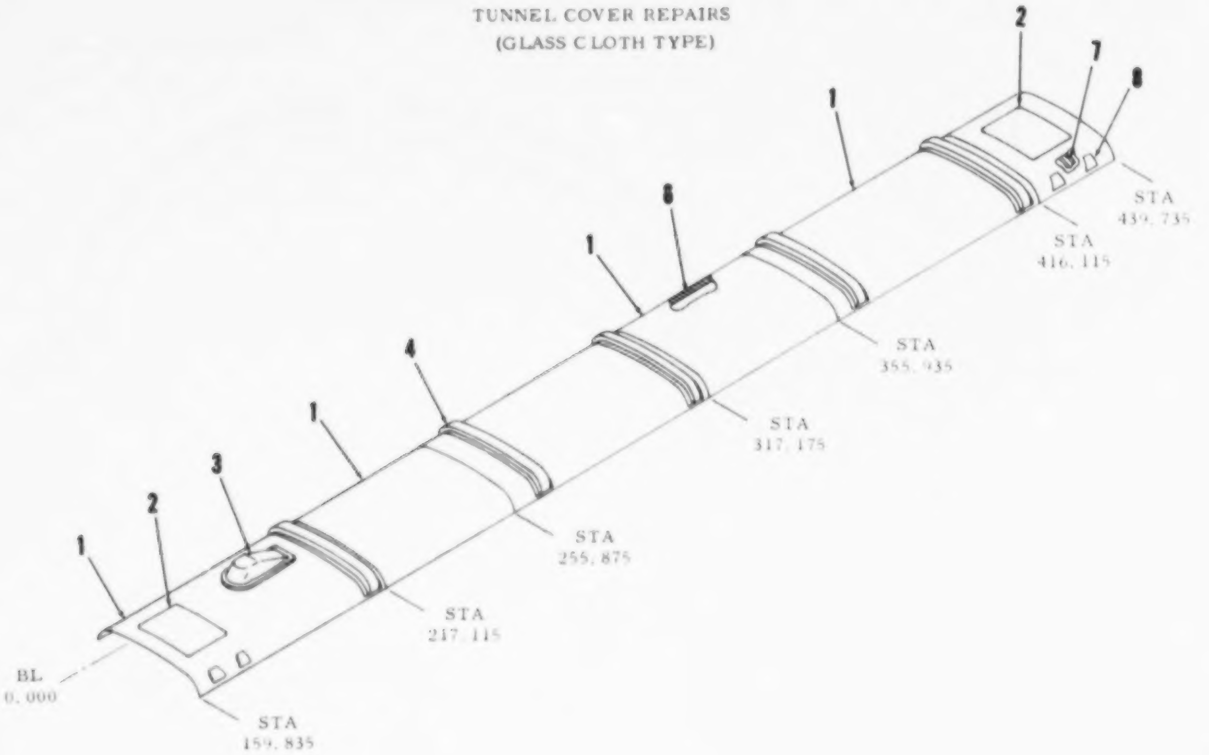

HONEYCOMB TUNNEL COVER OVERLAP
SEAL
FASTENER
HINGE PIN
NO. 6 TUNNEL COVER
NO. 5 TUNNEL COVER
FASTENER
NO. 4 TUNNEL COVER
NO. 3 TUNNEL COVER
NO. 2 TUNNEL COVER
NO. 1 TUNNEL COVER
FORMATION LIGHT
STRUT
FWD
42x54
B114-938-20J

Figure 2-62. Removal of Honeycomb Cabin Crown Access Covers


TUNNEL COVER REPAIRS
(GLASS CLOTH TYPE)
2
7
8
1
6
1
4
1
3
2
1
STA
439. 735
STA
416. 115
STA
355. 935
STA
317. 175
STA
255. 875
STA
217. 115
BL
0. 000
STA
159. 835

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	COVER	2-PLY. NO. 181 GLASS CLOTH	NOTE B.
2	STEP PLATE	0. 016 7076-T6 CLAD	NOTES C, AND F.
3	SUPPORT ASSEMBLY	4-PLY. NO. 181 GLASS CLOTH	NOTE B.
4	STIFFENER	4-PLY. NO. 181 GLASS CLOTH	NOTE B.
6	SEAL	- -	NOTE D.
7	CHANNEL	0. 032 2024-T4 CLAD	0. 040 2024-T3 CLAD
8	GUSSET	0. 032 2024-T4 CLAD	0. 040 2024-T3 CLAD

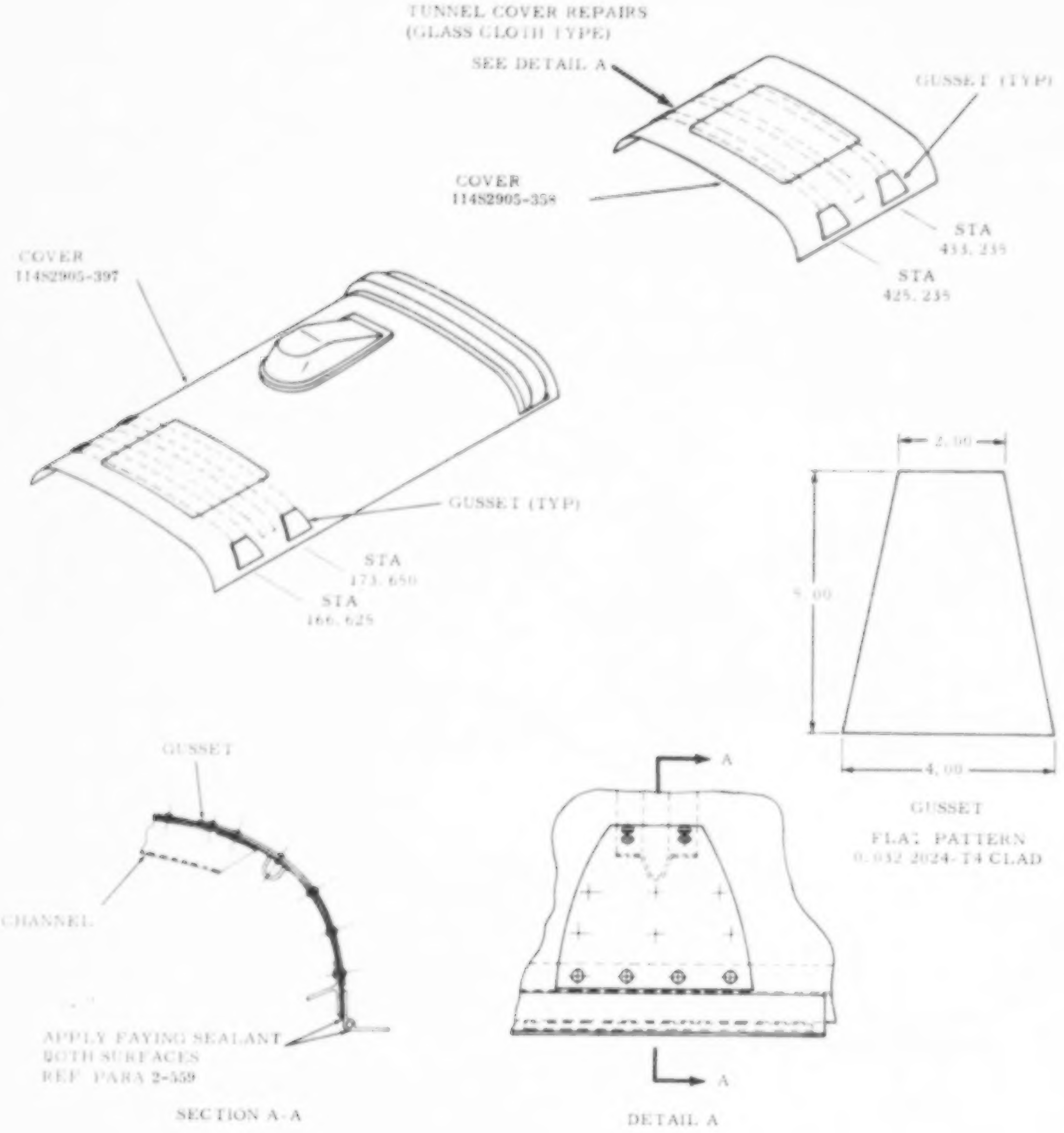
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO TM 55-1500-204-25/1 FOR TYPICAL REPAIRS TO CLASS CLOTH LAMINATED SECTIONS
C. REPLACE STEP PLATES WITH 114S2905-137. REFER TO PARA 2-574 FOR BONDING INFORMATION
D. REPLACE WITH NEW SEAL VS80544
E. UNLESS OTHERWISE NOTED, THE TUNNEL COVERS ARE SIMILAR IN MATERIALS AND METHOD OF CONSTRUCTION
F. APPLY WALKWAY MATERIAL (C377) AS DIRECTED IN PARA 2-636 WHEN REQUIRED BY WEAR OR REPAIRS

42x51

B114-302-34SV

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 1 of 9)


TUNNEL COVER REPAIRS
(GLASS CLOTH TYPE)
SEE DETAIL A
GUSSET (TYP)
COVER
11482905-358
STA
433.235
STA
425.235
COVER
11482905-397
GUSSET (TYP)
STA
173.650
STA
166.625
2.00
5.00
4.00
GUSSET
FLAT PATTERN
0.032 2024-T4 CLAD
GUSSET
CHANNEL
APPLY FAYING SEALANT
BOTH SURFACES
REF PARA 2-559
SECTION A-A
A
A
DETAIL A

⊕ EXISTING RIVETS. REPLACE WITH MS20470AD4 RIVETS

+ NEW RIVET LOCATIONS. INSTALL USAF 461-4-3 RIVETS AND AN960D WASHERS UNDER THE TAIL OF EACH RIVET

NOTE

ALL DIMENSIONS ARE IN INCHES

42x51

B114-303-345V

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 2 of 9)

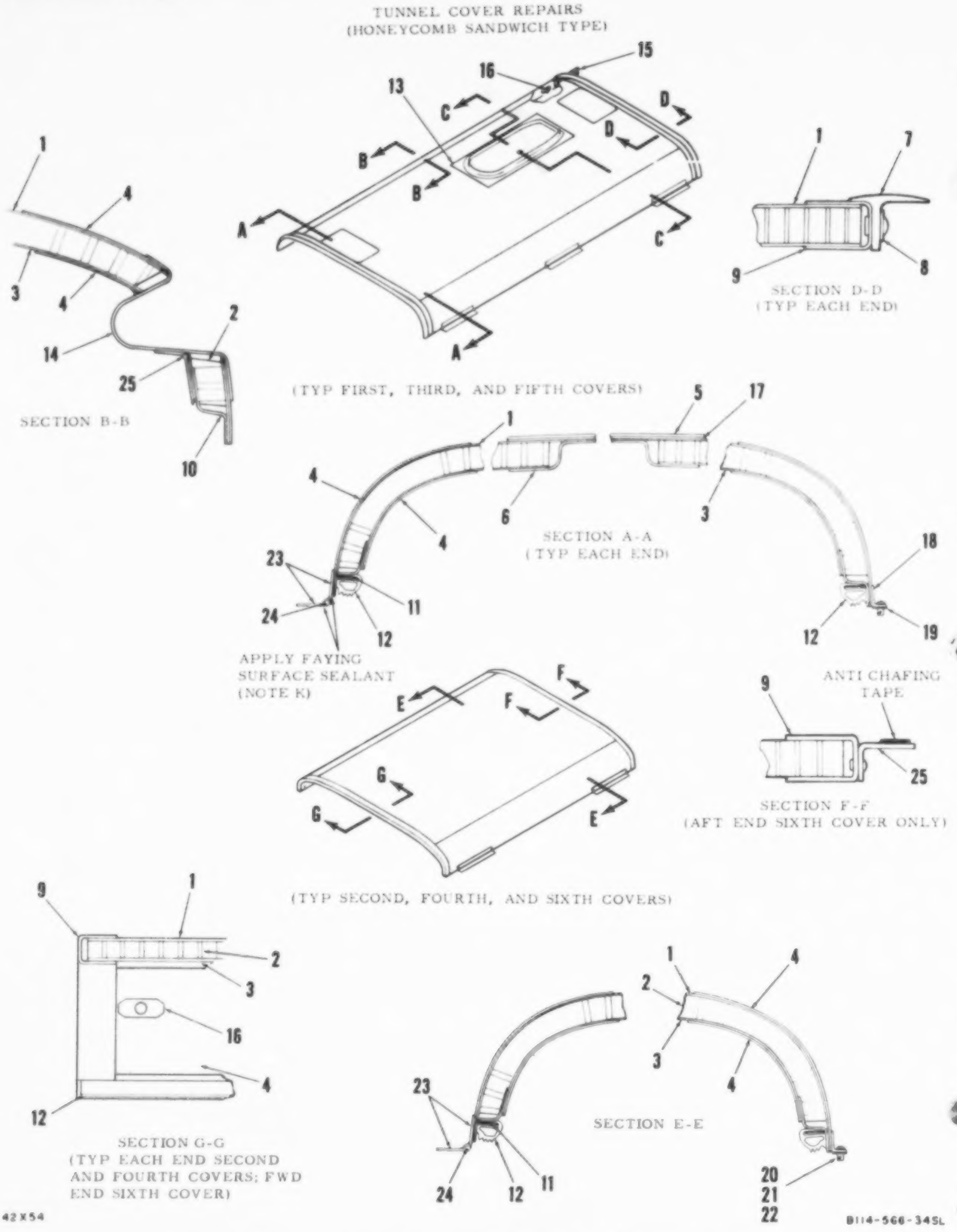

TUNNEL COVER REPAIRS
(HONEYCOMB SANDWICH TYPE)
15
16
13
C
D
D
B
B
A
C
A
(TYP FIRST, THIRD, AND FIFTH COVERS)
1
4
3
4
2
14
25
10
SECTION B-B
1
7
9
8
SECTION D-D
(TYP EACH END)
5
17
1
4
6
4
3
SECTION A-A
(TYP EACH END)
18
23
24
11
12
12
19
APPLY FAYING
SURFACE SEALANT
(NOTE K)
F
E
F
G
G
E
(TYP SECOND, FOURTH, AND SIXTH COVERS)
9
ANTI CHAFING
TAPE
25
SECTION F-F
(AFT END SIXTH COVER ONLY)
9
1
2
3
16
4
12
SECTION G-G
(TYP EACH END SECOND
AND FOURTH COVERS; FWD
END SIXTH COVER)
1
4
2
3
4
23
SECTION E-E
24
12
11
20
21
22
42X54
B114-566-345L

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 3 of 9)

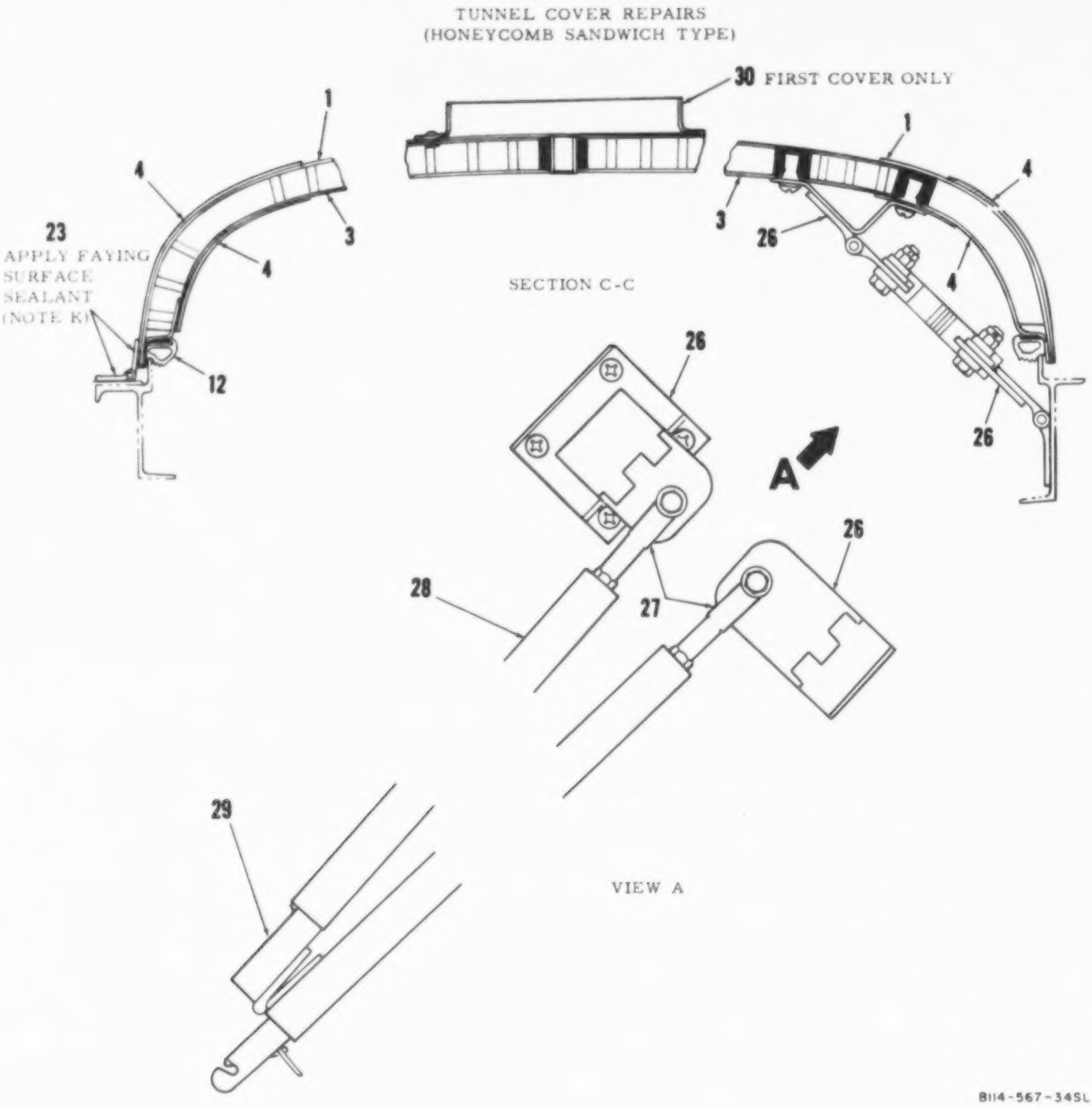

TUNNEL COVER REPAIRS
(HONEYCOMB SANDWICH TYPE)
30 FIRST COVER ONLY
1
4
3
23
APPLY FAYING SURFACE SEALANT (NOTE K)
4
12
SECTION C-C
1
4
3
26
4
26
26
A
26
28
27
26
29
VIEW A
B114-567-34SL

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 4 of 9)

TUNNEL COVERS (HONEYCOMB SANDWICH TYPE)			
INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	0.020 2024-T3 CLAD	0.020 2024-T3 CLAD
2	CORE	0.560 ±0.005 5052 FLEX-CORE	NOTE B.
3	SKIN	0.016 2024-T3 CLAD	0.016 2024-T3 CLAD
4	DOUBLER	0.020 2024-T3 CLAD	0.020 2024-T3 CLAD
5	DOUBLER	0.050 2024-T3 CLAD	NOTE C.
6	PAN	0.050 2024-T42 CLAD	NOTE D.
7	SEAL	BAC1530-86	NOTE C.
8	RETAINER	0.032 2024-T3 CLAD	0.032 2024-T3 CLAD
9	CHANNEL	0.032 2024-T3 CLAD	NOTE E.
10	ZEE	0.032 2024-T3 CLAD	NOTE E.
11	RETAINER	0.020 2024-T3 CLAD	0.032 2024-T3 CLAD
12	SEAL	VS80572-1	NOTE C.
13	DOUBLER	0.032 2024-T3 CLAD	NOTE C.
14	HAND GRIP	0.050 6061-T3	NOTE F.
15	STRAP	NYLON WEBBING	NOTE G.
16	STUD	BACS21AR1	NOTE H.
17	FILLER	0.050 2024-T3	NOTE H.
18	ANGLE	BAC1503-2731	NOTE H.
19	SEAL	114S2905-323	NOTE C.
20	SPRING	114S3910-161	NOTE H.
21	GROMMET	GA5-312	NOTE H.
22	STUD	AJ5-55	NOTE H.
23	HINGE	MS20257-4-7	NOTE I. AND K.
24	PIN	MS20253-2-740	SEE SHEET 6
25	ANGLE	0.032 2024-T42	NOTE E.
26	HINGE	MS20001PH12	NOTE J.
27	BEARING	MS20200K3L	NOTE H.
28	SHIELD	BACT63A59-0	NOTE H.
29	STRUT	A297-1	NOTE H.
30	SUPPORT	114S2633-1	NOTE H.

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REFER TO PARA 2-631 FOR HONEYCOMB SANDWICH REPAIRS

C. REPLACE WITH SAME MATERIAL AS ORIGINAL. REFER TO TABLE 2-17 FOR BONDING INFORMATION

D. REPAIR AS SHOWN IN SHEET 7 OR REPLACE WITH NEW PAN 114S2915-92 OR -94 IN COVER ASSEMBLY 114S2915-70 OR -75, OR NEW PAN 114S2915-92 OR -93 IN COVER ASSEMBLY 114S2915-72 OR -77

E. PART OF BONDED ASSEMBLY. REPLACE WITH SAME MATERIAL AS ORIGINAL

F. REPLACE WITH NEW GRIP 114S2915-52

G. REPLACE WITH NEW STRAP 114S2915-79 OR FABRICATE ONE FROM NYLON WEB 1 INCH X 6 INCH EYELET AND WASHER.

H. REPLACE WITH NEW PART SAME AS ORIGINAL

I. REFER TO PARA 2-657 FOR REPAIR

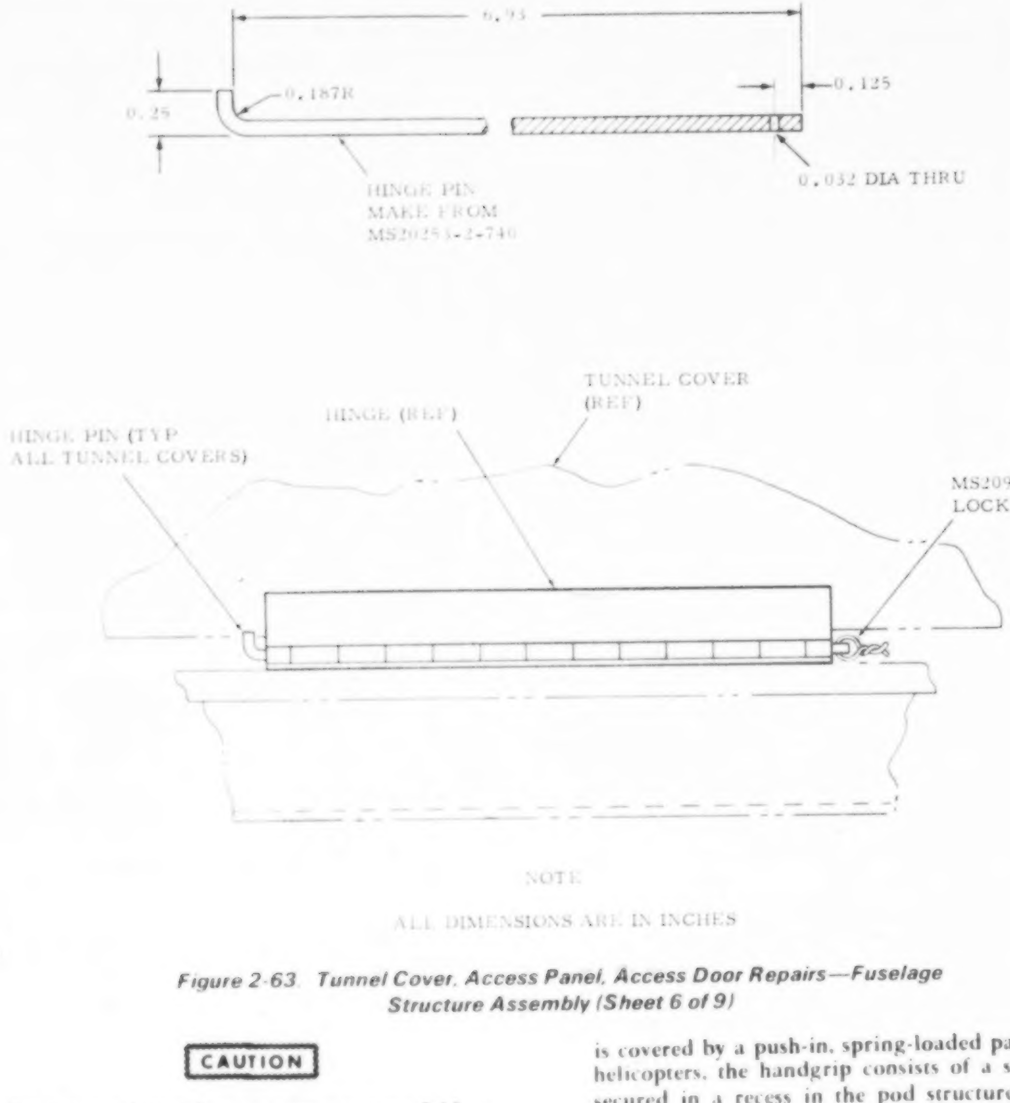
J. REPLACE WITH NEW HINGE ASSEMBLY 114S2915-60 ON COVER ASSEMBLY OR 114S2915-59 ON FUSELAGE STRUCTURE

K. APPLY FAYING SURFACE SEALANT BETWEEN HINGE HALFS, FUSELAGE, AND TUNNEL COVER. REFER TO PARA 2-559

42X54

B114-568-345V

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 5 of 9)


HINGE PIN REPAIRS

NOTE

ALL DIMENSIONS ARE IN INCHES

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 6 of 9)

CAUTION

Do not use heavy foot pressure to open foldout steps. Excessive foot pressure can damage the latch actuating pin.

a. Foldout steps. Three steps (5) are installed in the right pod structure: two at sta 200 and one at sta 430. The steps are hinged at the lower edge and supported in the open position by cable assemblies (6).

b. Recessed steps. There are three recessed steps (8) on the side of the fuselage, directly above the forward foldout steps. There are three more steps in the aft pod area between the engine work platform and the foldout step. Three more steps are located on the side of the fuselage directly above the aft foldout step. All recessed steps are covered by a spring-loaded door that is flush with the fuselage.

c. Handgrip. The handgrip (7) is located near the upper edge of the pod structure at sta 200. On CH-47B helicopters, the handgrip is integral with the pod structure. It is covered by a push-in, spring-loaded panel. On CH-47C helicopters, the handgrip consists of a swiveling handle secured in a recess in the pod structure. The handle is spring-loaded on 68-15820 and subq.

2-231. *Inspection of Foldout Steps, Recessed Step, and Handgrip.* (See fig. 2-65.) Inspect for the following conditions:

a. Step hinges for security and corrosion.

b. Step cables for fraying and corrosion.

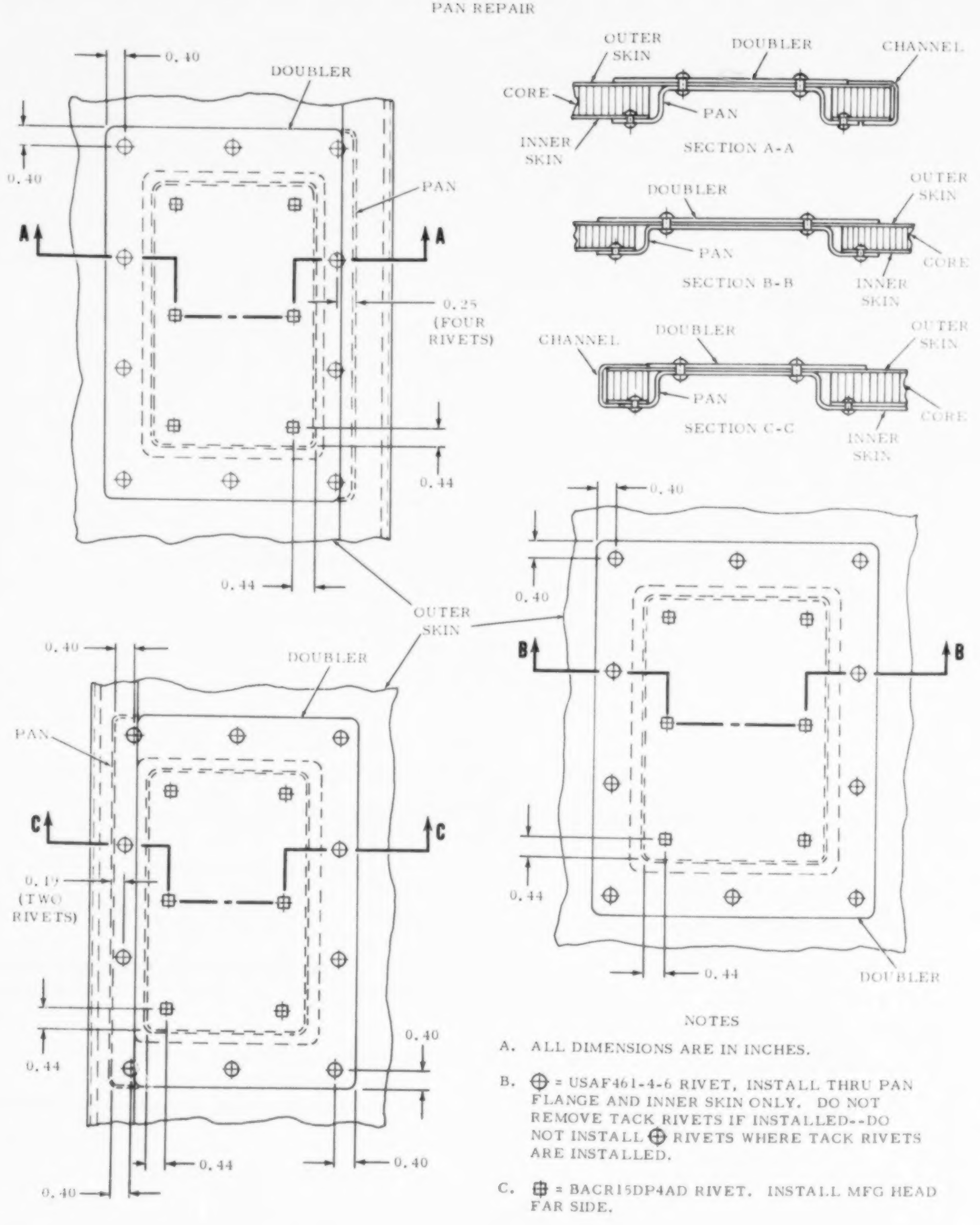
c. Handgrip for security and corrosion, especially at retaining plate (7, fig. 2-67.)

2-232. *Removal of Foldout Step.* (See fig. 2-65.)

a. Open foldout step (5).

b. Disconnect cable assemblies (6) by removing cotter pins (1) and pins (2).

c. Remove screws (3), washers (4), and foldout step (5).


PAN REPAIR
0.40
DOUBLER
0.40
PAN
A
A
0.25
(FOUR
RIVETS)
0.44
0.44
OUTER
SKIN
DOUBLER
CORE
OUTER
SKIN
CHANNEL
PAN
INNER
SKIN
SECTION A-A
DOUBLER
OUTER
SKIN
PAN
CORE
SECTION B-B
INNER
SKIN
CHANNEL
DOUBLER
OUTER
SKIN
PAN
CORE
SECTION C-C
INNER
SKIN
0.40
0.40
B
B
0.44
0.44
DOUBLER
0.40
DOUBLER
PAN
C
C
0.19
(TWO
RIVETS)
0.44
0.40
0.44
0.40
0.40

NOTES

A. ALL DIMENSIONS ARE IN INCHES.

B. ⊕ = USAF461-4-6 RIVET, INSTALL THRU PAN FLANGE AND INNER SKIN ONLY. DO NOT REMOVE TACK RIVETS IF INSTALLED--DO NOT INSTALL ⊕ RIVETS WHERE TACK RIVETS ARE INSTALLED.

C. ⊞ = BACR15DP4AD RIVET. INSTALL MFG HEAD FAR SIDE.

42 x 54

B114-573-34SK

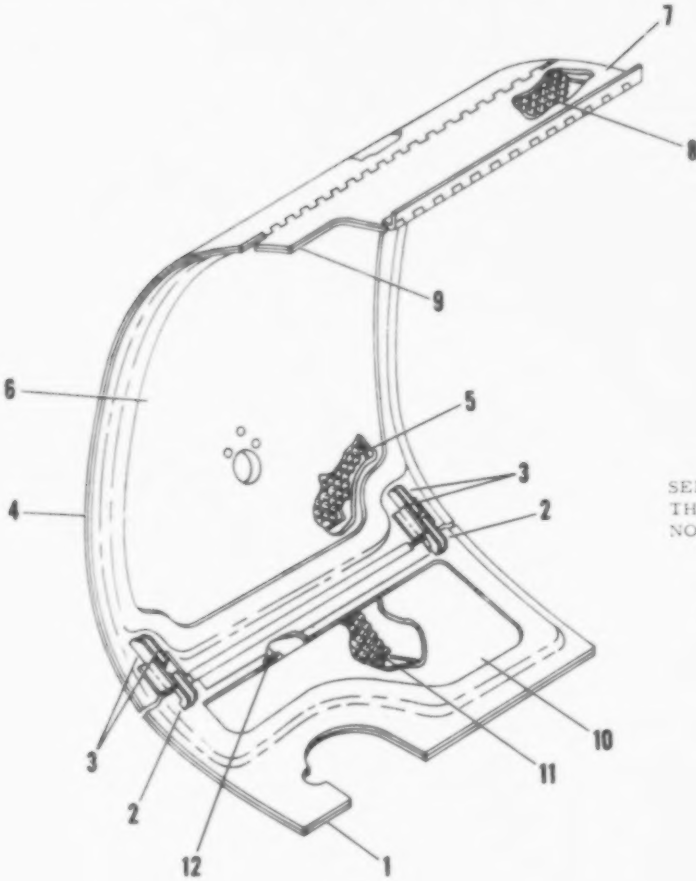
Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 7 of 9)

2-233. ***Repair.*** Burnished nicks, scratches and dents are permissible if the burnished area does not interfere with opening. See fig. 2-3 for examples of damage to formed parts. Refer to paragraph 2-241 for step cables replacement.

2-234. Installation of Foldout Step. **(See fig. 2-65.)**

a. Position the replacement foldout step (5) in place and secure it to the fuselage with screws (3) and washers (4). If

LANDING GEAR ACCESS PANEL



SEE SHEET 9
THIS FIGURE FOR
NOTES

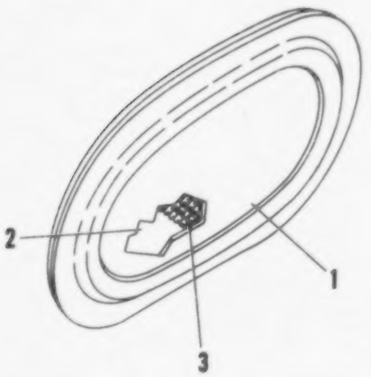
INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	0.016 7075-T6 CLAD	NOTE B.
2	BRACKET	0.063 7075-T6 CLAD	0.063 7075-T6 CLAD
3	BRACKET	ALCOA 22991	0.071 4130
4	SKIN	0.016 7075-T6 CLAD	NOTE B.
5	CORE	0.509, 2.3-1/4-10N-3003	NOTE B.
6	SKIN	0.012 7075-T6 CLAD	NOTE B.
7	SKIN	0.016 7075-T6 CLAD	NOTE B.
8	CORE	0.590, 2.3-1/4-10N-3003	NOTE B.
9	SKIN	0.012 7075-T6 CLAD	NOTE B.
10	SKIN	0.016 7075-T6 CLAD	NOTE B.
11	CORE	0.590, 2.3-1/4-10N-3003	NOTE B.
12	CORE	0.590, 23.4-1/8-60N-3003	NOTE B.

42x51

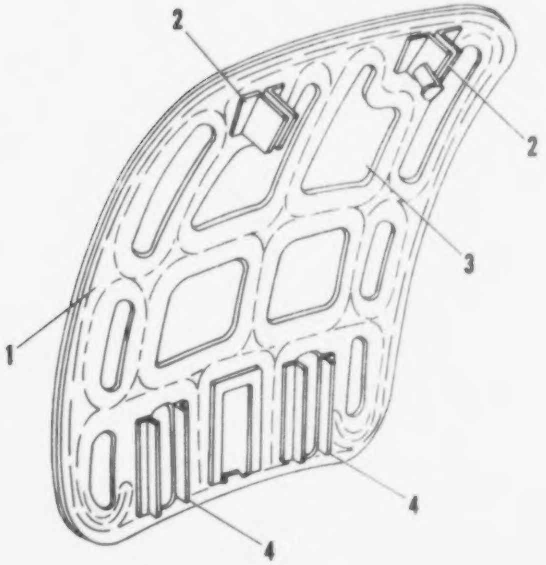
B114-95-345V

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 8 of 9)

FUEL PUMP ACCESS PANEL



ELECTRICAL COMPARTMENT ACCESS DOOR



FUEL PUMP ACCESS PANEL

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	0.012 7075-T6 CLAD	NOTE B.
2	SKIN	0.016 7075-T6 CLAD	NOTE B.
3	CORE	0.590, 3.4-1/4-015N-3003	NOTE B.

ELECTRICAL COMPARTMENT ACCESS DOOR

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
2	SUPPORT	ALCOA 13816 7075-T6	0.100 4130	--
3	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
4	STIFFENER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--

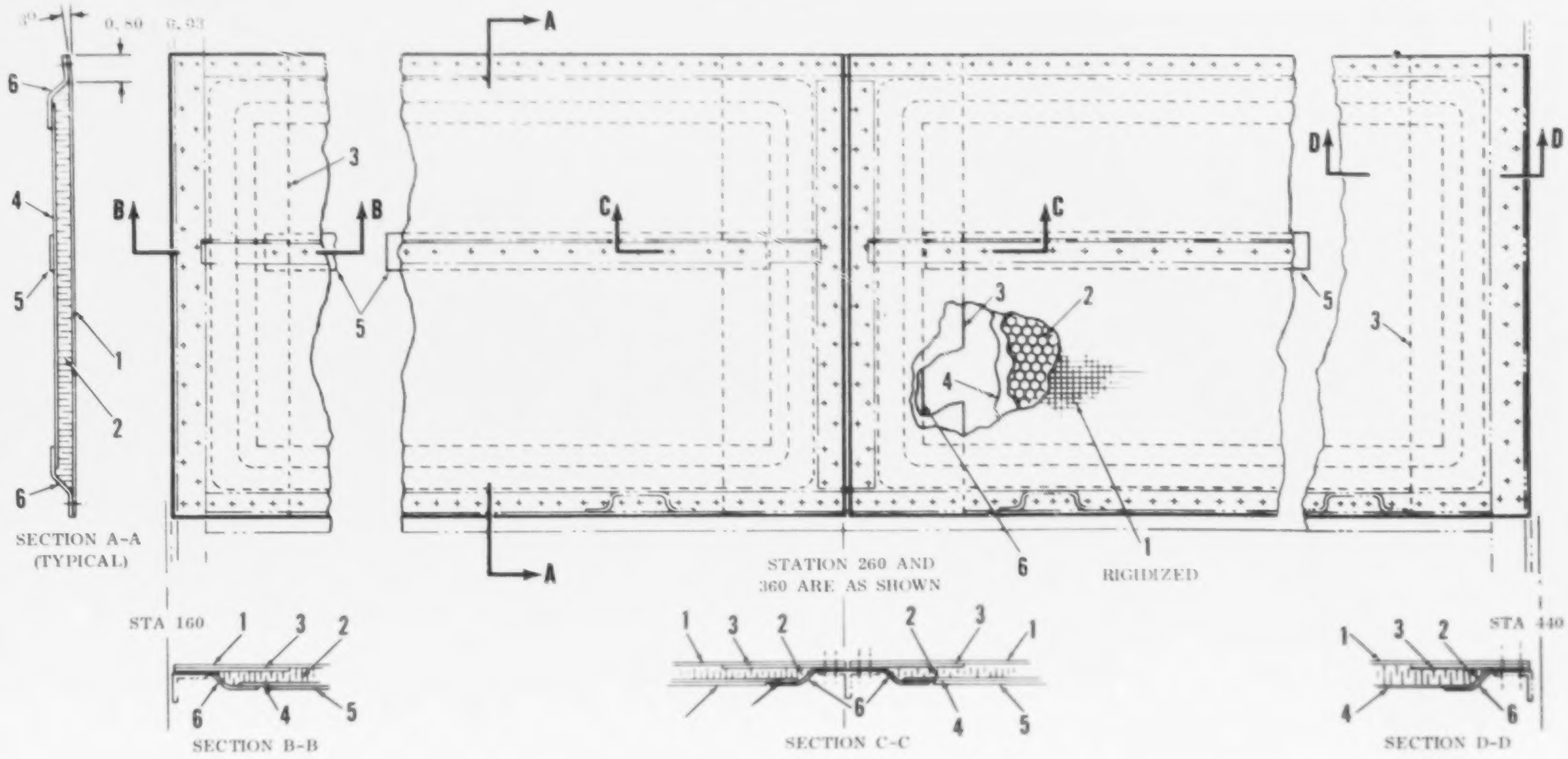
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO PARA 2-631 FOR REPAIR OF SANDWICH HONEYCOMB STRUCTURES
C. REFER TO TM 55-1500-204-25/1 FOR INFORMATION ON SPOTWELDING
D. SEE FIG. 2-125 FOR INFORMATION ON SEALING FOR WATERTIGHTNESS

42x51

B114 96 345M

Figure 2-63. Tunnel Cover, Access Panel, Access Door Repairs—Fuselage Structure Assembly (Sheet 9 of 9)


3°
0.80
0.93
6
4
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1
2
6
SECTION A-A (TYPICAL)
B
B
3
5
A
A
C
C
D
D
3
2
4
6
1
RIGIDIZED
5
3
STATION 260 AND 360 ARE AS SHOWN
STA 160
1
3
2
6
4
5
SECTION B-B
1
3
2
2
3
1
6
4
5
SECTION C-C
STA 440
1
3
2
4
6
SECTION D-D

INDEX	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	RIGIDIZED	0.016 2024-T4 CLAD	NOTE B.
2	CORE	0.50 3.4-1/4-15N-3003	NOTE B.
3	DOUBLER	0.012 7075-T6 CLAD	NOTE B.
4	SKIN	0.012 7075-T6 CLAD	NOTE B.
5	DOUBLER	0.016 7075-T6 CLAD	NOTE B.
6	EDGE MEMBER	NOTE C.	

NOTES

A. ALL DIMENSIONS ARE IN INCHES

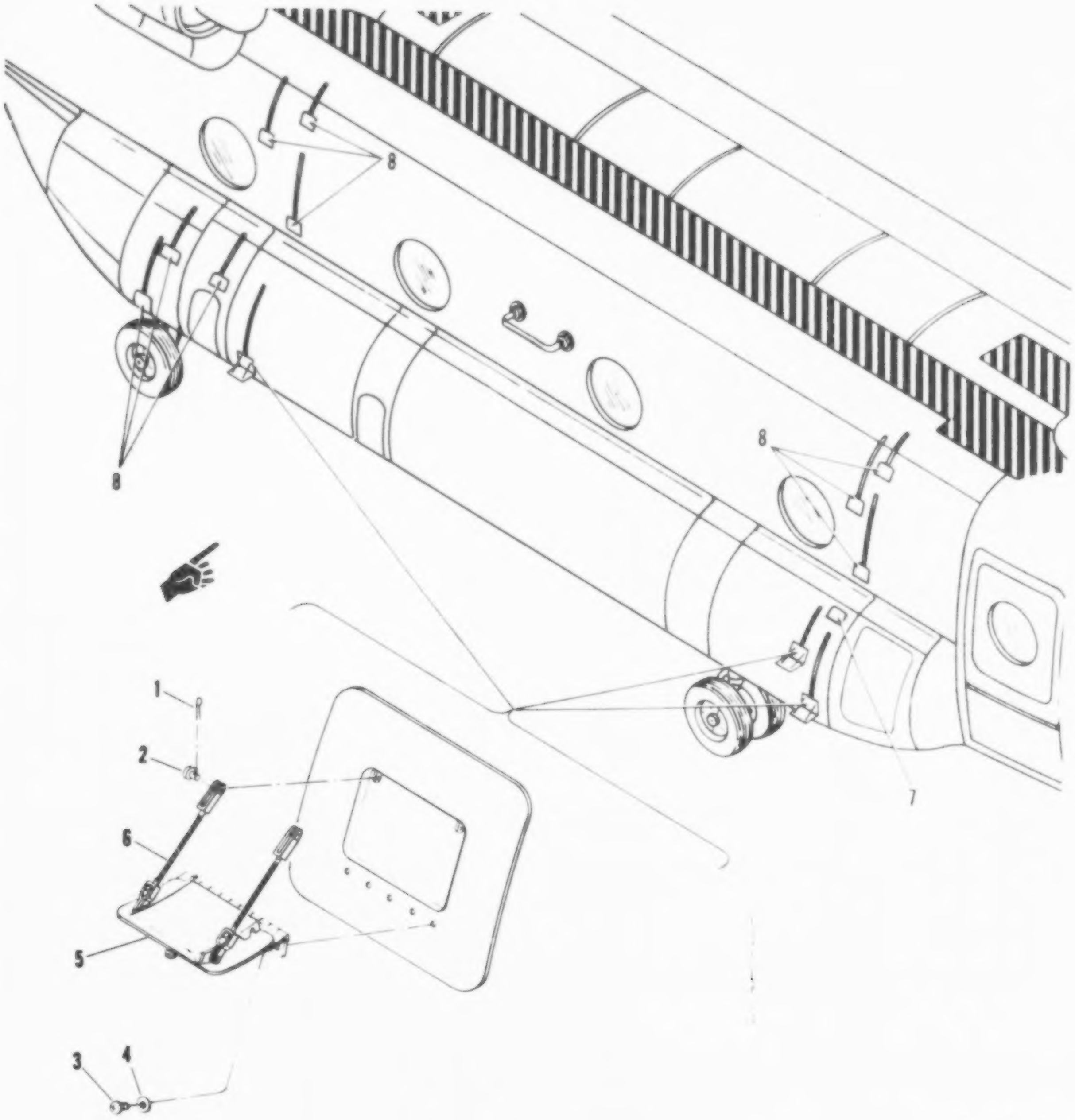
B. MEMBER OF BONDED ASSEMBLY. REFER TO TM 55-1500-204-25/1 FOR REPAIR TO SANDWICH HONEYCOMB STRUCTURE

C. SCOTCH PLY-2 LAYERS CROSS PLY TYPE XP-114 (0.028 THICK) AND 1 LAYER CROSS PLY TYPE 1002 (0.020 THICK). NON-WOVEN CONTINUOUS FILAMENT

54 x 39

601-345V

Figure 2-64. Cabin Crown Walkway Repairs—Cabin Fuselage Structure Assembly



1. Cotter pin
2. Pin
3. Screw
4. Washer
5. Foldout step
6. Cable assembly
7. Handgrip
8. Recessed step

Figure 2-65. Fuselage Foldout Step and Handgrip

the original step is being installed, inspect the cables for general condition.

b. Connect the cable assemblies (6) to the fuselage with pins (2) and cotter pins (1).

c. Close the foldout step (5).

2-234.1. Removal of Recessed Step Door. (See fig. 2-65.1.) Remove spring-loaded door (2) from any of the recessed steps as follows:

a. Remove rivets (5) securing hinge (6) to the top of fiberglass shell (4).

NOTE

The fuselage step shells are reached from inside the helicopter. The shells of the pod steps are reached thru the fuel pod panel.

b. Pull out door (2) and hinge (6).

c. If necessary, remove the rivet securing bonding jumper (3) to the door and hinge.

2-234.2. Repair of Recessed Step Door. (See fig. 2-65.1.) Repair is limited to replacement of spring (7) or the halves of hinge (6). Remove pin (8) to replace these items.

2-234.3. Installation of Recessed Step Door. (See fig. 2-65.1.) Install spring-loaded door (2) on any of the recessed steps as follows:

a. If removed, connect bonding jumper (3) to the door and hinge.

b. Close the hinge halves against spring tension. Align door and hinge (6) with the edge of the opening in frame (1). Align the rivet holes in the hinge with holes in the top of fiberglass shell (4).

c. Rivet the hinge to the shell.

2-235. Removal of Handgrip (CH-47C). (See fig. 2-66.)

a. Remove the right forward auxiliary fuel tank. (Refer to para 10-96.)

b. Remove the five screws (1). Remove cover plate (2).

c. Remove anti-chafing tape (3) from the pod structure inner skin.

d. Remove the four nuts (4), washers (5), and screws (6). Remove the handle retaining plate (7) and handle (8) from the pod structure (9).

2-236. Repair. Refer to para 2-233.

2-237. Installation of Handgrip (CH-47C). (See fig. 2-66.)

a. Install handle (8) and retaining plate (7) in the pod structure recess. Use screws (6), washers (5), and nuts (4). On 68-15820 and subq make sure that the end of the handle tension spring is housed in the retaining plate groove.

b. Have the heads of screws (6) covered with antichafing tape (3).

c. Install cover plate (2) with screws (1).

d. Install the right forward auxiliary fuel tank. (Refer to para 10-104.)

2-238. Pods.

(See fig. 2-67.) The pods are located on the lower-left and lower-right sides of the fuselage and extend from sta 160 to sta 555. Some components of the ac electrical system and the engine condition control system are located inside the right pod forward section. Some components of the dc electrical system are located inside the left pod forward section. An external power receptacle and access panel are located in the left pod forward section. Fuel tank assemblies are located in each pod. Centrally located in the pods is a main fuel tank assembly. On CH-47B helicopters, provisions for auxiliary fuel tanks are installed forward and aft of the main tanks. On CH-47C helicopters, auxiliary fuel tanks are installed forward and aft of the main fuel tanks. Main fuel tank assemblies are interchangeable. The two pods house the attachment points for the two forward and two aft landing gear assemblies which are attached to the airframe.

2-239. Inspection of Pods. (See fig. 2-67.) Inspect for the following conditions:

a. Sealant for deterioration.

b. Loose or missing screws.

c. Damaged or corroded hinges.

d. Pods for cracks and damage.

e. Pod-to-fuselage fairing for cracks, damage, and voids.

2-240. Removal. (See fig. 2-67.) Remove the left or right pod sections as follows:

a. Remove screws (1) securing the pod-to-fuselage fairing (2). Remove the fairing.

b. Remove the forward landing gear panels (3) as follows:

(1) Open the landing gear access panel (3). Disconnect the bonding wire, navigation light connector, and the clips securing the navigation light electrical wires.

(2) Remove screws (4) securing upper panel (5). Remove upper panel and access panel (3).

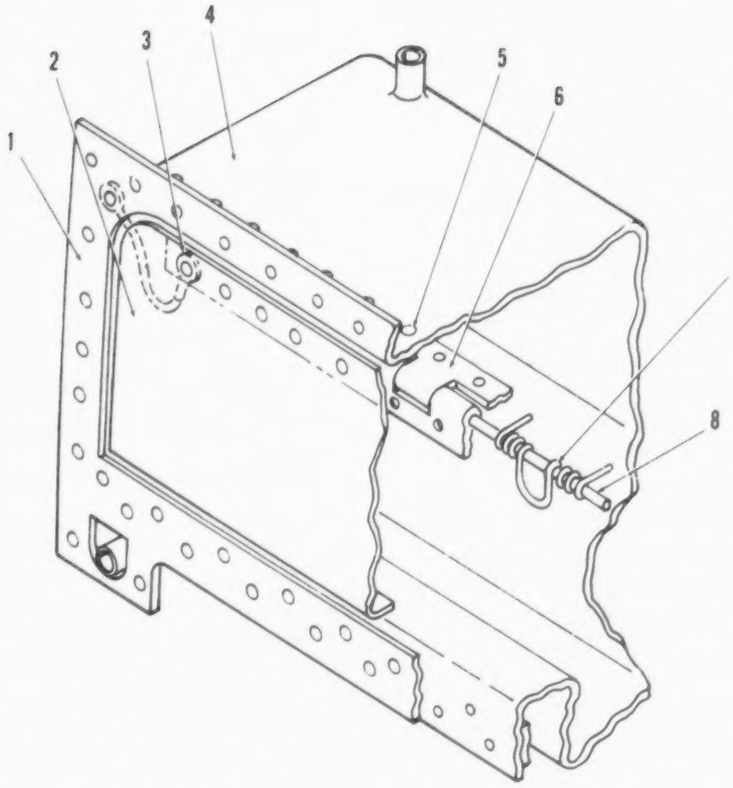
(3) Remove screws (6) securing the lower panel (7). Remove the lower panel.

c. Remove the coaming assembly (8) as follows:

(1) Open door assembly (9). Remove cotter pins (10), washers (11), and pins (12). Remove the door assembly.

(2) Remove screws (13) securing the coaming assembly (8) to the forward pod section. Remove the coaming assembly.

d. On CH-47C helicopters, remove forward auxiliary fuel tank pod assembly (14). (Refer to para 10-96.) If

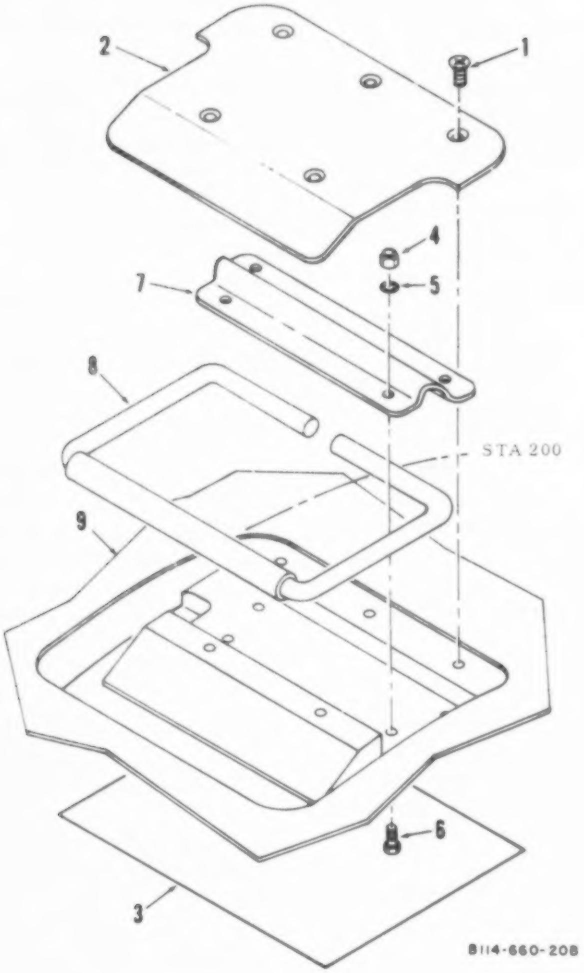


42z39

B114-34-23

1. Frame
2. Door
3. Bonding jumper
4. Fiberglass shell
5. Rivet
6. Hinge
7. Hinge spring
8. Hinge pin

Figure 2-65.1. Recessed Step, Typical


1
2
4
5
7
8
STA 200
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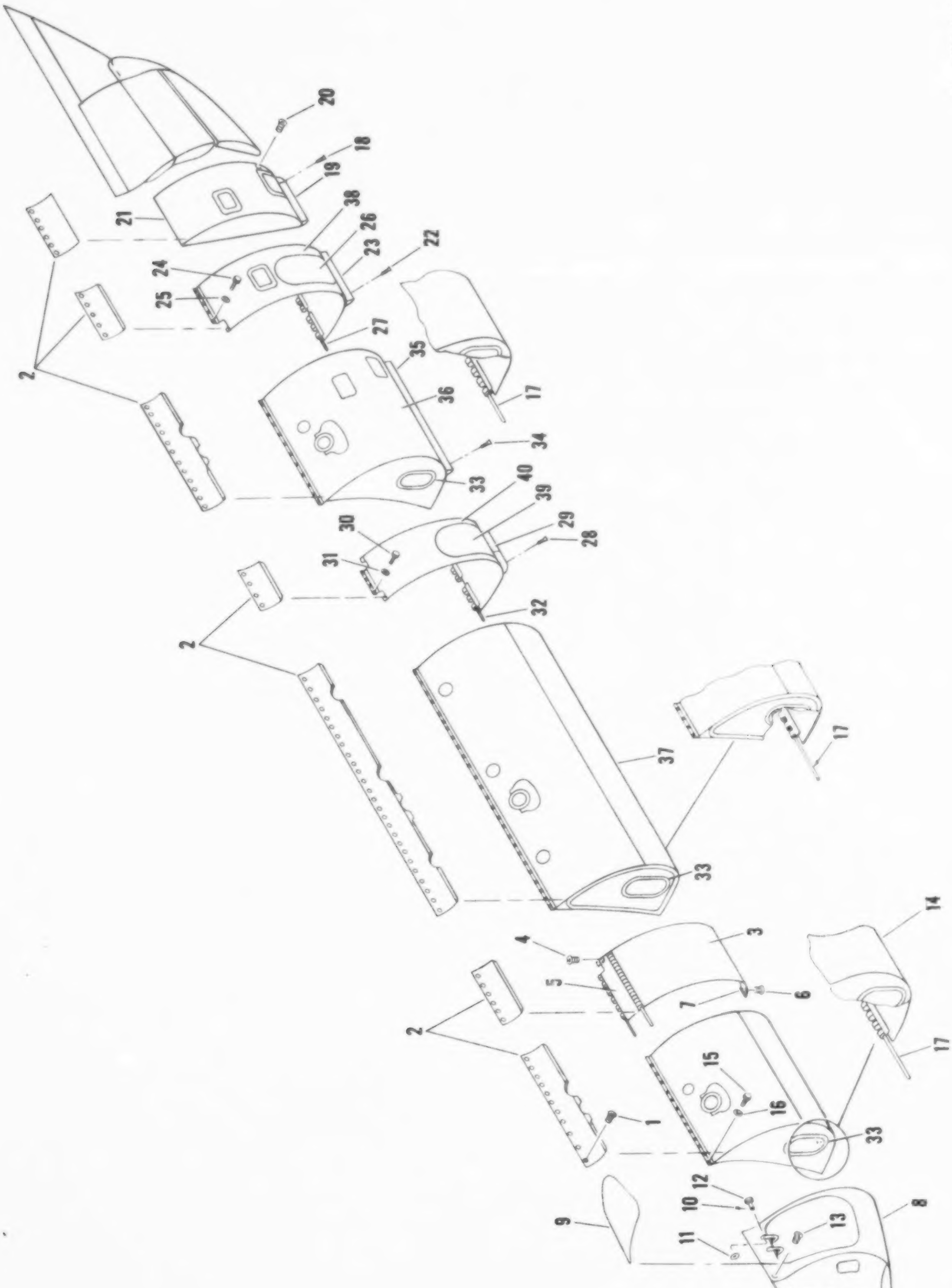
6
3
8114-660-208

1. Screw
2. Cover plate
3. Anti-chafing tape
4. Nut
5. Washer
6. Screw
7. Retaining plate
8. Handle
9. Pod structure

Figure 2-66. Handgrip Installation, CH-47C


B114-286-20G
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40
54x39

Figure 2-67. Fuselage Pods

necessary, remove the forward auxiliary fuel tank support structure on CH-47B helicopters. Remove support-structure (14) as follows:

(1) Remove bolts (15) and washers (16) that secure the top of structure (14) to the fuselage.

(2) Lower structure (14) on its hinge. Support the structure in the lowered position. Disconnect the bonding wires from the fuselage.

(3) Spray the hinge along the lower edge of support structure (14) with penetrating lubricant (C209).

(4) While supporting the structure, remove hinge pin (17) from the lower edge of the structure. Remove support structure (14).

e. On CH-47C helicopters, remove aft auxiliary fuel tank pod assembly (36). (Refer to para 10-108.) If necessary, remove the aft auxiliary fuel tank support structure on CH-47B helicopters. Remove support structure (36) as follows:

(1) Drain the fuel from tank (37). (Refer to para 10-127 or 10-181.)

(2) Check that all electrical power is OFF. Unplug the battery cable.

(3) Remove access panels (33 and 39).

(4) Disconnect the fuel lines at the forward end of the tank support structure. Disconnect the fuel lines and the fuel drain lines at the aft end of the tank support structure. (Refer to para 10-135 or 10-189 and see fig. 10-2 or 10-7.)

(5) On CH-47B helicopters without the crash resistant fuel system, unplug the electrical connectors from the fuel selector valve and the fuel pressure switch. (See fig. 10-7.)

(6) Remove the row of screws from the aft end of tank (37) to panel (40).

(7) Remove the row of screws from the aft end of panel (38) to the aft pod structure.

(8) Support the structure. Remove the bolts and washers that secure the top of panels (38 and 40) and structure (36).

(9) Lower the structure on its hinge. Support the structure in the lowered position. Disconnect the bonding wires from the fuselage.

(10) Spray the hinge along the lower edge of panels (38 and 40) and structure (36) with penetrating lubricant (C209).

(11) Remove hinge pins (17, 27 and 32).

(12) If support structure (36) is to be replaced, proceed as follows:

(a) Remove the fittings from the forward and aft access doors in the pod structure.

(b) Remove the fuel line from the support structure.

(c) Separate panels (38 and 40) from structure (36) by removing the attaching screws.

(d) Separate the section of strake (35) from the tank support structure.

f. Remove the main fuel tank assembly (37). (Refer to para 10-6 or 10-41 for CH-47B. Refer to para 10-84 for CH-47C.)

g. Remove screws (18) securing strake (19) to skin assembly (21).

h. Remove screws (20) securing the skin assembly (21) to the airframe. Remove the skin assembly.

2-241. *Repair.*

a. Damage more extensive than negligible to sheet panels which does not, after pre-repair steps, affect more than 25 percent of skin area between boundary members, and clears structural boundary members, can be repaired by patching. See fig. 2-7.

b. The following type of dents must be repaired:

(1) Dents larger than 50 square inches.

(2) Dents exceeding a total of 200 square inches per panel.

(3) More than two dents in a 40-inch length of panel.

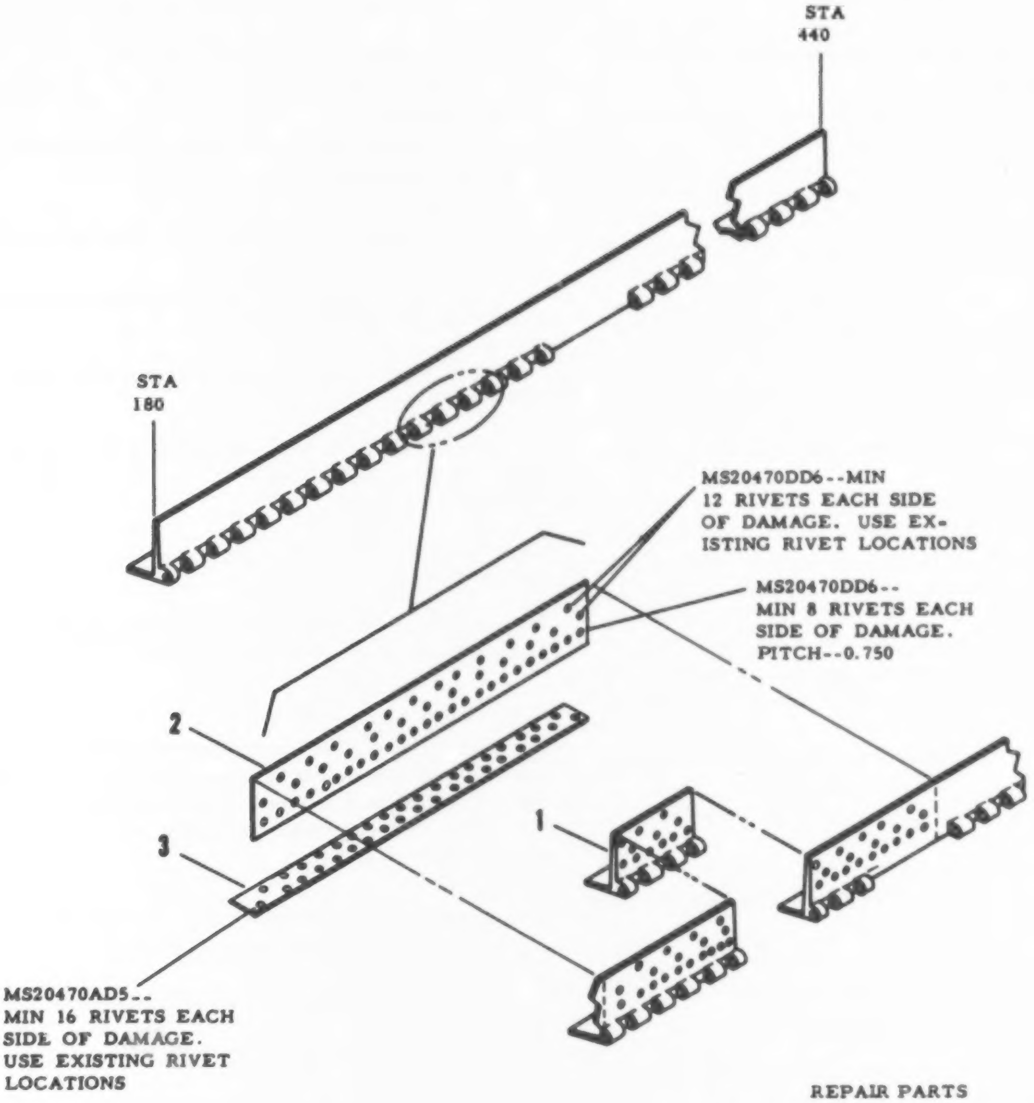
(4) Dents containing fractures or punctures.

c. (AVIM). Damage which requires insertion of less than a full panel can be repaired. See fig. 2-7. Reinforcements shall be same material as original and of next heavier thickness. Repairs to sandwich honeycomb sections should be made as described in TM 55-1500-204-25/1. A repair to either skin of a sandwich honeycomb section shall not exceed 100 square inches after trimming and be no closer than 20 inches to another repair. All repairs shall be sealed watertight. Refer to para 2-554. See fig. 2-68 for applicable repair information for the hinge. Protrusions resulting from repairs within the fuel cell area should be covered with anti-chafing tape. Refer to para 2-586.

(1) Repair T-cap extrusion as follows: (See fig. 2-69.)

Legend for figure 2-67

1. Screw
2. Pod-to-fuselage fairing
3. Landing gear access panel
4. Screw
5. Panel
6. Screw
7. Panel
8. Coaming
9. Door
10. Cotter pin
11. Washer
12. Pin
13. Screw
14. **Forward auxiliary fuel tank or support structure**
15. Bolt
16. Washer
17. Hinge pin
18. Screw
19. Strake
20. Screw
21. Skin
22. Screw
23. Strake
24. Bolt
25. Washer
26. Access panel
27. Hinge pin
28. Screw
29. Strake
30. Bolt
31. Washer
32. Hinge pin
33. Access panel
34. Screw
35. Strake
36. **Aft auxiliary fuel tank or support structure**
37. **Main fuel tank**
38. **Fuel pod panel**
39. **Access panel**
40. **Fuel pod panel**



MS20470DD6--MIN 12 RIVETS EACH SIDE OF DAMAGE. USE EXISTING RIVET LOCATIONS

MS20470DD6--MIN 8 RIVETS EACH SIDE OF DAMAGE. PITCH--0.750

MS20470AD5--MIN 16 RIVETS EACH SIDE OF DAMAGE. USE EXISTING RIVET LOCATIONS

REPAIR PARTS

1. HINGE REPLACEMENT--114S2506-69, -70, -71, OR -72 AS APPLICABLE--MACHINE TO CONFIGURATION OF ORIGINAL DAMAGED SECTION
2. REINFORCEMENT--0.15 7075-T6
3. REINFORCEMENT--0.10 7075-T6

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO PARA 2-554 FOR SEALING

42x51

B114-110-345V

Figure 2-68. Hinge Repairs—Cabin Fuselage Structure Assembly

NOTE

The following procedure requires removal and installation of the pod from the helicopter to facilitate repairs. Refer to para 2-240 and 2-242.

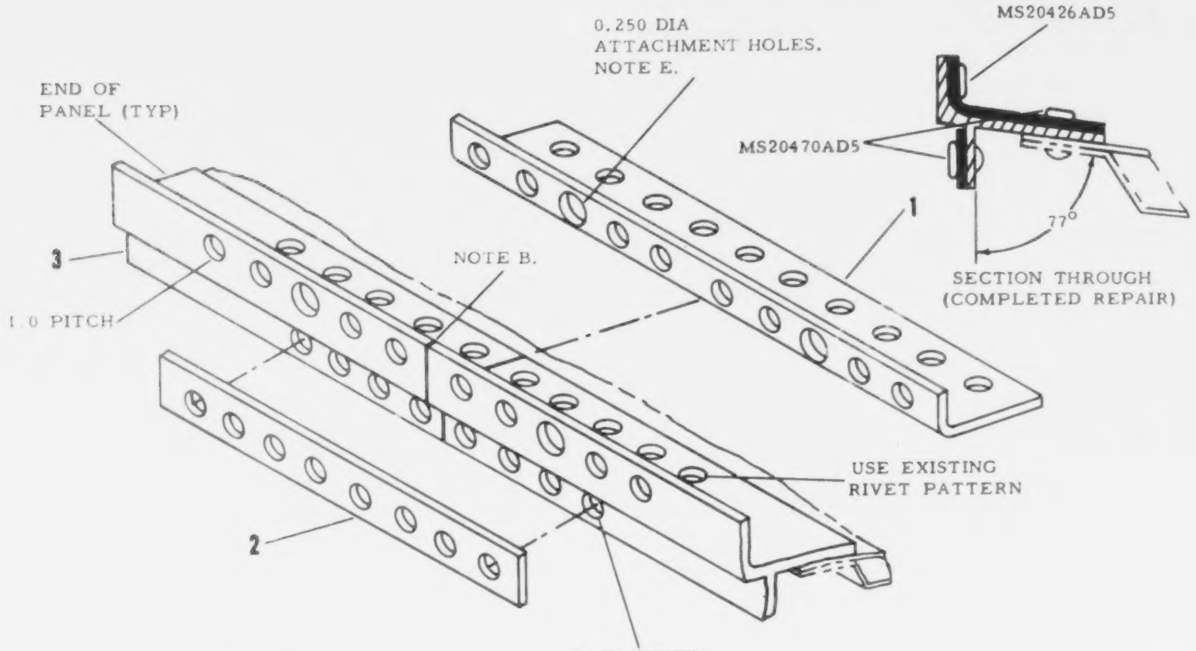
(a) Remove section of damaged T-cap back to and in line with nearest primary fuselage former.

(b) Replace it with a corresponding length of new extrusion or formed equivalent, and clamp it in place.

(c) Drill 0.161-inch-diameter holes in extrusion, using existing rivet locations in pod skin, and temporarily fasten extrusion in place.

(d) Remove five rivets thru existing extrusion and pod skin.

(e) Fabricate a splice angle of 4130 steel, 6⅜-inches long, 2-inches wide, and an angle of 77°.



REPAIR PARTS

1. REINFORCEMENT. 0.060, 4130
2. REINFORCEMENT. 0.032, 4130
3. REPLACEMENT. VS90529, 7075-T6

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REMOVE THE DAMAGED TEE CAP BACK TO THE CENTERLINE OF THE NEXT MAIN FUSELAGE FRAME
C. INSULATE DISSIMILAR METALS, REFER TO PARA 2-619
D. COVER ALL INTERNAL PROTRUSIONS RESULTING FROM THIS REPAIR. REFER TO PARA 2-586 APPLY TWO COATS OF PRIMER (C259) TO ANY BARE METAL PARTS
E. ATTACHMENT HOLES SHOWN ARE FOR REFERENCE ONLY. USE A HOLE FINDER TO DETERMINE THE EXACT LOCATION OF THE ATTACHMENT HOLES WITH THE POD TEMPORARILY INSTALLED ON HELICOPTER

42x38

8114 98 345V

Figure 2-69. T-Cap Repairs, Pod Installation—Cabin Fuselage Structure Assembly

(f) Position splice angle as shown in fig. 2-69, to pick up five rivet holes each side of splice joint. Clamp in place.

NOTE

Splice angle must fit contour of extrusion.

(g) Drill five holes each side, using a 0.161-inch-diameter drill.

(h) Remove all clamps, temporary fasteners, and replacement parts. Deburr all holes. Apply two coats of primer (C259) to all exposed metal and faying surfaces in repair area.

(i) Install replacement parts and splice angle, using rivets MS20470AD5. See fig. 2-69 for location of rivet heads.

(j) Install pod on helicopter temporarily, and locate pod attachment holes in replacement parts with a hole finder.

(k) Remove pod from helicopter and drill required attachment holes in T-cap, using a ¼-inch-diameter drill.

(l) Locate and drill four 0.161-inch-diameter holes, each side of splice, in area of splice angle. Space holes to avoid interference with pod attachment holes.

(m) Countersink and deburr holes.

(n) Fabricate a flat splice plate from 0.032-inch-thick 4130 steel, 7½-inches long and ¾-inch wide.

(o) Position splice plate to pick up holes drilled in step (12). Space rivets ⅞ inch if a pattern does not exist.

(p) Drill required 0.161-inch-diameter holes through splice plate and lower leg of Tee cap.

(q) Remove splice plate, deburr holes, and apply two coats of primer (C259) to all exposed metal and faying surfaces of splice plate.

(r) Install splice plate, using rivets MS20426AD5. See fig. 2-69 for location of rivet heads.

(s) To prevent chafing of the fuel tank, apply antichafing tape over all repair protrusions. Refer to para 2-586.

(2) Replacement of cable assemblies on pod foldout steps.

(a) The cable assemblies are attached to the step with pins retained by cotter pins. To remove pins, a ½-inch-diameter hole must be drilled thru each face of step so cotter pin can be replaced. Locate hole 1/25-inch from outer face of pivot fitting so that it will intersect the centerline of the pin.

(b) After new cable assemblies are installed and pin safetied in place, cover holes with 1-inch-diameter disks, using 0.030-inch-thick 7075-T6 aluminum alloy on outer surface and 0.030-inch-thick 301 CRES on inside. Bond disks in place with adhesive system No. 1. Refer to para 2-540.

NOTE

Swaged end terminals may be bonded to the socket in the end pieces, using adhesive system No. 6 if required to assure proper folding of cables. Refer to para 2-545.

(c) Apply antichafing tape (C333) to pod skin if cables chafe. Extensive skin damage or numerous isolated damages necessitate replacement of the full skin panel. Damage to the hinge which cannot be repaired by insertion necessitates replacement. Replacement shall be made to include original members and existing rivet patterns. Care should be exercised when riveting, and a check should be made to ensure existing adjacent rivets have not failed or loosened. Sandwich honeycomb panels should be replaced with panels of the same type as original and installed in the same manner.

2-241.1 Skin Void Repair(AVIM). (See fig. 2-69.1)

a. Damage to skin area of POD which results in voids or dents of less than 100 square inches are acceptable without repair.

b. Any damage to skin area of POD which exceeds 100 square inches are repairable. There is no upper limit on the amount of area repairable on the POD.

c. The voids shall be repaired as follows:

(1) Define exact area to be repaired using a tapping hammer and mark with a felt tip pen.

(2) Using a drill with a skin saw or a high speed drill and a No. 1 router bit, cut through the front skin on the inside of the pattern line. Do not damage the back skin.

(3) Cut through the remaining core down to the pack skin using a sharp knife.

(4) Roll the cut skin back using a slotted tube.

(5) Remove the core from the repair area using blunt nose pliers. Abrade the exposed adhesive on the back skin with a sanding disc to remove the adhesive fillets left by the removed core. Do not grind through the back skin.

NOTE

If there is any trace of corrosion on the back skin, remove all original adhesive, taking care not to overheat the skin by sanding in one spot too long.

(6) Blow out all chips, debris and adhesive residue with clean, dry air. Straighten exposed, damaged core cells with a scribe.

(7) Remove the drain and fill fittings in the area of the repair.

NOTE

All remaining steps in the bonding process shall be accomplished using surgeon's gloves (NSN 6515-00-782-6477) and performing in a work area dedicated to honeycomb bonding and repair. Do not touch bare hands to bonding surfaces after they have been cleaned. Observe safety precautions when using solvents and epoxy adhesive.

(8) Clean entire repair area by wiping with MEK or trichloroethylene and wipe dry with dry, clean cloths. Blow edges of repair area dry with low pressure air.

NOTE

Prevent excess solvent from penetrating bonded area of surrounding honeycomb.

(9) Prefit replacement core. It must be of the same material, density, and height as the original. The ribbon direction must be the same as the existing core. If necessary, longitudinal cuts may be made to the new core to get it to contour to the surface of the POD. Fit the replacement as close as possible without crushing the honeycomb. Clean the new core with trichloroethylene and dry.

(10) On the face of the outer skin, surround the repair a minimum of two inches outside the repair area with a bead of zinc chromate paste (NSN 8030-00-664-4968).

(11) Coat the back skin and honeycomb edges to be bonded with epon 934, or equivalent, per manufacturer's instructions, 3 to 5 mils thick.

(12) Cover the entire repair area with a perforated plastic or cotton bunting sheet (NSN 8305-00-082-2865). Mold release (NSN 9330-00-290-6149) should be used on the underside of the material.

(13) Embed a vacuum hose in the paste with the hose extending onto the cover sheet a minimum of two inches.

(14) Cover complete area with a vacuum bag or plastic sheet 0.050 inch thick and press into the paste to form a bag.

(15) Apply a vacuum of 24 plus or minus 4 inches high to the bag. On patches exceeding 144 square inches apply a vacuum of 29 plus or minus 1 inch high. Allow repair to cure with vacuum applied for a minimum of 12 hours at a temperature of 65° to 80° F.

NOTE

Once the adhesive has been applied, the process must be completeed without interruption until vacuum has been applied and the bond is curing.

(16) Remove the bag, hose and cover sheet.

(17) Fabricate a skin insert from material of the same alloy and thickness as the original skin to bring the repaired area flush with the existing skin. Coat the inside surface of skin insert and exposed areas of the replacement core with epon 934 per manufacturer's instructions to a thickness of 3 to 5 mils.

(18) Apply vacuum and cure in accordance with steps (12) thru (16) above.

(19) Fabricate a skin patch with a minimum two inch overlap of the replacement core. The material shall be of the same alloy and one gauge greater than the existing skin.

(20) Lay out rivet pattern in the area of the overlap. Rivet spacing shall be in accordance with TM 55-1500-204-25/1.

(21) Abrade the entire two inch overlap area of the original skin with a rotary sanding disc to remove paint and foreign material. Prevent dust from contaminating other patches being done in the area.

(22) Clean area with MEK and coat entire area with epon 934.

(23) Apply skin patch and vacuum in accordance with steps (12) thru (16) above and allow to cure 24 hours.

(24) Also rivet patch to skin using a double row of 0.125 inch diameter cherry rivets or equivalent. Use a two inch spacing and one inch between rows.. The rivets shall be coated with epon 934 and installed wet.

(25) Reinstall drain and filler fittings being sure to seal the rivets in the filler neck area to prevent fuel and water from leaking around the filler neck apron. To allow drainage of fuel and water, do not seal the edges of the apron but only the attaching rivets.

(26) Inspect the repaired area for voids by coin tapping. If available, ultrasonic inspection methods may be used. No voids are permitted between the honeycomb and the honeycomb inlay patch. Small voids may occur between the inlay skin and the overlay patch. These type voids may be filled by injecting epon 934 through a 0.040 inch hole drilled in the skin.

2-242. Installation. (See fig. 2-67.) Seal the pods during installation with sealant (C300/301) to ensure watertightness. Install the left or right pod sections as follows:

a. Before installation of the pod sections, visually inspect the following:

(1) Check all skin assemblies and access panels for loose or missing rivets.

(2) Check all formers, splice plates, skins and doublers for cracks and security of attachment.

(3) Check for missing, loose or damaged plate nuts and eyebolts.

(4) Check for missing or defective bonding wires.

(5) Check all hinges for security of attachment and defective hinge lugs.

(6) Check hinge pins for signs of wear and corrosion. Check that pins are secure in their respective hinges.

(7) Check pod section support straps for tears, fraying, and security of attachment.

(8) Check tape (C343) on the skin and access panel assemblies. Replace the tape if required.

(9) Check the rubber seal on the pod-to-fuselage fairing (2). Replace the seal if required. Make the seal from silicone rubber (C282). Secure the seal with adhesive (C14).

(10) Check step assemblies for security of attachment. Make sure that step doors are free to move. Make sure that they return flush to the outer skin when released.

b. On CH-47C helicopters, install forward auxiliary fuel tank assembly (14). (Refer to para 10-105.) Install the forward auxiliary fuel tank support structure on CH-47B helicopters as follows:

(1) Support tank support structure (14) in a lowered position. Align the hinge half of the structure with the hinge half of the fuselage. Install the hinge pins. Secure the hinge pins. Use lockwire (C206).

(2) Connect the bonding wires to the fuselage.

(3) Raise the structure into position. Secure the top of the structure to the fuselage with the bolts and washers.

(4) Install the screws at the forward end of the forward landing gear upper hinged panel (3).

(5) Install the row of screws in the forward end of the splice plate at the forward end of structure (14).

c. On CH-47C helicopters, install aft auxiliary fuel tank assembly (36). (Refer to para 10-117.) Install the aft auxiliary fuel tank support structure on CH-47B helicopters as follows:

(1) If a replacement tank support structure (36) is being installed, proceed as follows:

(a) Position panel (40) on the forward end of tank support structure (36). Install the screws.

(b) Position panel (38) on the aft end of tank support structure (36). Install the screws.

(c) Install the section of strake (23, 29, and 35) on the panels and the tank support structure. Install the screws and washers.

(d) Install the fittings on the forward and aft access doors of the tank support structure. Apply sealant

(C301) to the faying surfaces of the fitting and doors.

(e) Coat the fuel line fitting threads. Use petrolatum (C244). Install the fuel line in the support structure. Secure the line in position with two clamps.

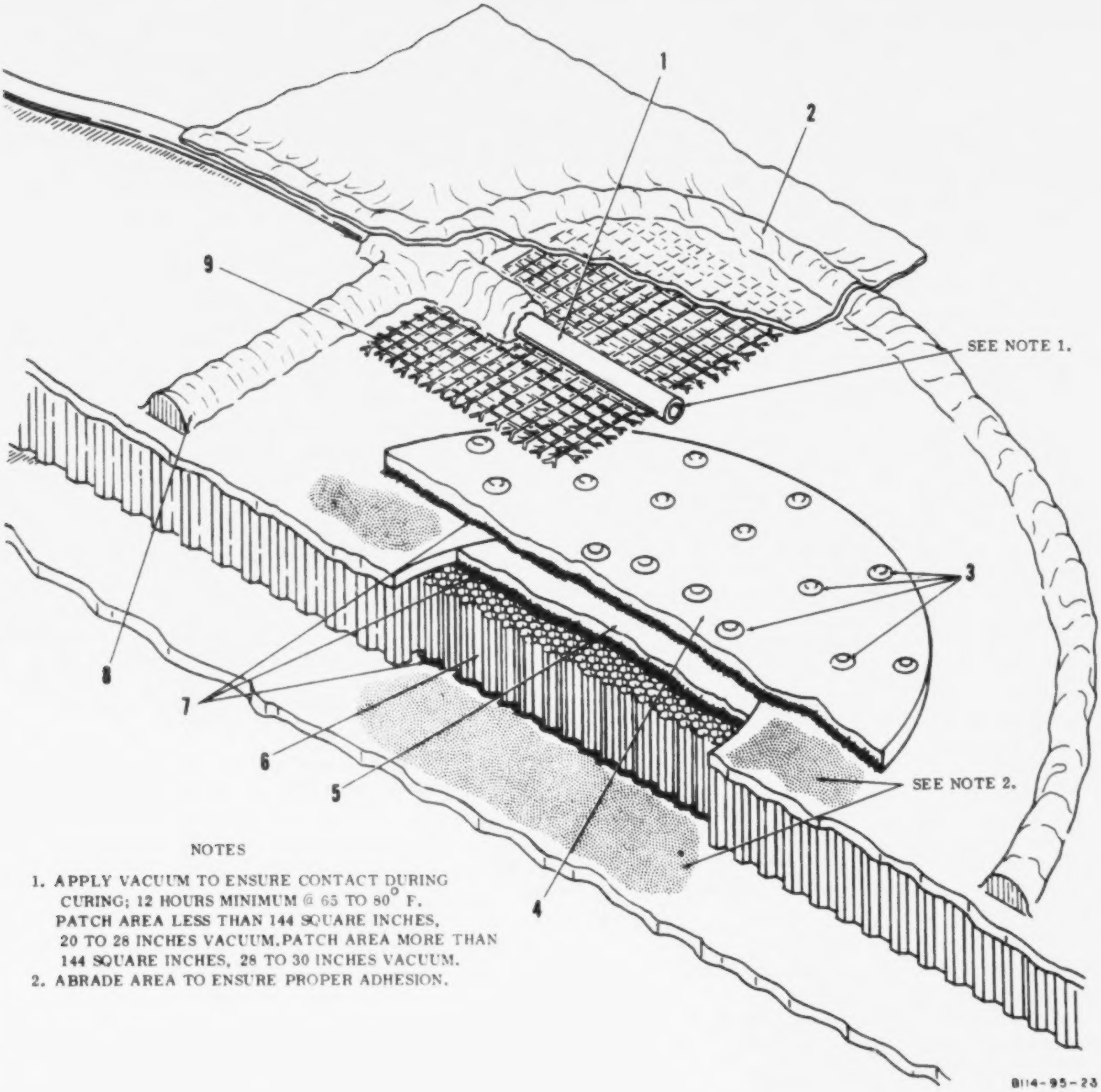
(2) Support the structure and panels in the lowered position. Align the hinge half of the structure and panel assembly with the hinge half of the fuselage. Install and secure the hinge pins. Use lockwire (C206).

(3) Connect the bonding wires to the fuselage.

(4) On CH-47B helicopters with the crash resistant fuel system, clean the fuselage beam, the support structure and the panel top edge. Use cleaning solvent (C137). Apply a thin coat of parting agent (C237) along the fuselage beam. Spread sealant (C301) to the top edge of the support structure and panels. Make sure the sealant is spread evenly.

(5) Raise the support structure and panels into position. Secure the top edge of the structure and panels to the fuselage. Use bolts and washers.

(6) Install the screws at the forward end of panel (40) and the aft end of panel (38).



NOTES

1. APPLY VACUUM TO ENSURE CONTACT DURING CURING; 12 HOURS MINIMUM @ 65 TO 80° F. PATCH AREA LESS THAN 144 SQUARE INCHES, 20 TO 28 INCHES VACUUM. PATCH AREA MORE THAN 144 SQUARE INCHES, 28 TO 30 INCHES VACUUM.
2. ABRADE AREA TO ENSURE PROPER ADHESION.

1. Vacuum tube
2. Vacuum seal (plastic sheet or vacuum bag)
3. Rivet pattern lay-out
4. Skin patch
5. Skin insert
6. Core material insert
7. Adhesive, EC-2216 (C32)
8. Zinc chromate paste (C238.1)
9. Porous material (burlap)

Figure 2-69.1. Pod Repair

(7) On CH-47B helicopters without the crash resistant fuel system, connect the electrical plugs to the fuel selector valve and the fuel pressure switch. (See fig. 10-7.)

(8) Coat the fuel fittings threads. Use petrolatum (C244).

CAUTION

When connecting fuel lines to the support structure forward and aft access doors, do not allow the fitting in the doors to turn. Internal failure may occur and block fuel flow.

(9) Connect the fuel lines at the forward end of the tank support structure. Connect the fuel lines and the fuel drain lines at the aft end of the tank support structure. (Refer to para 10-135 or 10-189 and see fig. 10-2 or 10-7.)

(10) Install access panels (26 and 39).

d. Install the main fuel tank assembly (37). (Refer to para 10-7 or 10-42 for CH-47B. Refer to para 10-93 for CH-47C.)

e. Align skin assembly (21) with the airframe. Install screws (20).

f. Install the pod coaming assembly (8) as follows:

(1) Align the pod coaming assembly to the pod forward section. Install screws (13).

(2) Align door assembly (9) with the pod coaming assembly. Install pins (12) thru the door and pod coaming hinges. Secure the pins in position with washers (11) and cotter pins (10).

g. Install the forward landing gear access panels (3) as follows:

(1) Align lower panel (7) with the airframe. Install screws (6).

(2) Align upper panel (5) with access panel (3). Install screws (4).

(3) Connect the bonding wire, navigation light connector, and the clips securing the navigation light electrical wires.

(4) Close the landing gear access panel (3).

h. Align the pod-to-fuselage fairing (2) and install screws (1).

i. Service the fuel system. (Refer to para 1-2.)

j. Bleed the fuel system. (Refer to para 10-130 or 10-184 or 10-250.) Check the fuel line connections that were disturbed. Make sure there are no leaks.

2-243. *Fuel Pod Bottom Panels.*

On CH-47B helicopters with crash resistant fuel tanks, a panel is installed between sta 262.16 and 372.36 in the bottom of each fuel pod. A typical panel consists of two sections of urethane foam moldings bonded to the inside surface of the pod.

2-244. *Inspection*. Cracks, scratches, or gouges less than 0.25 inch wide and 0.25 inch deep are permitted. Dents in material less than 3.0 inches square and 0.25 inch deep are also permitted.

2-245. *Repair*. Damage more extensive than that defined as negligible can be repaired as follows:

a. Remove any loose or deteriorated pieces of panel in area of repair.

b. Clean area to be repaired. Sand lightly using abrasive paper (C3 or C4) No. 320 grit.

c. Prepare a batch of urethane foam (C155). Follow the directions on the container.

WARNING

Isocyanate chemical and its vapors are toxic and irritating to the eyes, skin, and respiratory tract. During mixing and foaming, ensure that adequate ventilation is provided. Full face masks shall be worn if vapor concentrations are high.

d. Preheat area to be filled to 100° to 110°F (39° to 43°C). Use heat lamps.

e. Pour mixture into area to be filled. Allow foam to expand and harden at room temperature 70°F (21°C). Cure at room temperature for ½ hour.

f. Sand the filled area to same level of surrounding foam. Use abrasive paper (C3 or C4) No. 320 grit. Extensive damage to the panel which is not reparable necessitates replacement. Remove entire damaged panel and clean area thoroughly. Bond replacement panel in place. Use cement (C90). Refer to para 2-536.

2-246. *Backing Board Assembly—CH-47B With Crash Resistant Fuel System.*

(See fig. 2-70.) The backing boards provide protection for the fuel tank in all areas—inboard, outboard, forward, and aft. The outboard backing board is installed between the fuel tank and the tank pod. The inboard backing board is installed against the fuselage skin at sta 262.1 to 372.4. The forward and aft backing boards are installed between the fuel tank and the tank pod. All boards are held in position with anti-chafing tape applied along the edges of the boards. The assembly consists of a polyester impregnated glass cloth bonded to a polyurethane foam sheet. Most of the backing board is of three-ply construction. The lower 4 inches is of 13-ply construction. There are 11 laminated phenolic blocks across the top. The backing board is attached to the fuselage skin with screws. Antichafing tape is applied over the screw heads and board edges.

2-247. *Inspection*. Inspect for damage that can be repaired by a simple procedure, such as stop-drilling small cracks or burnishing scratches or dents. Extensive damage to the impregnated glass cloth parts which cannot be repaired by patching, necessitates replacement of the entire backing board assembly. Damage to the backing boards used with crash-resistant fuel tanks necessitates replacement.

2-248. *Removal*. Remove either main tank backing board as follows:

a. Lower the main tank assembly. (Refer to para 10-6.)

b. (See fig.2-70.) If an inboard backing board is being removed, proceed as follows:

(1) Remove the anti-chafing tape from around all the board edges.

(2) Remove the backing board.

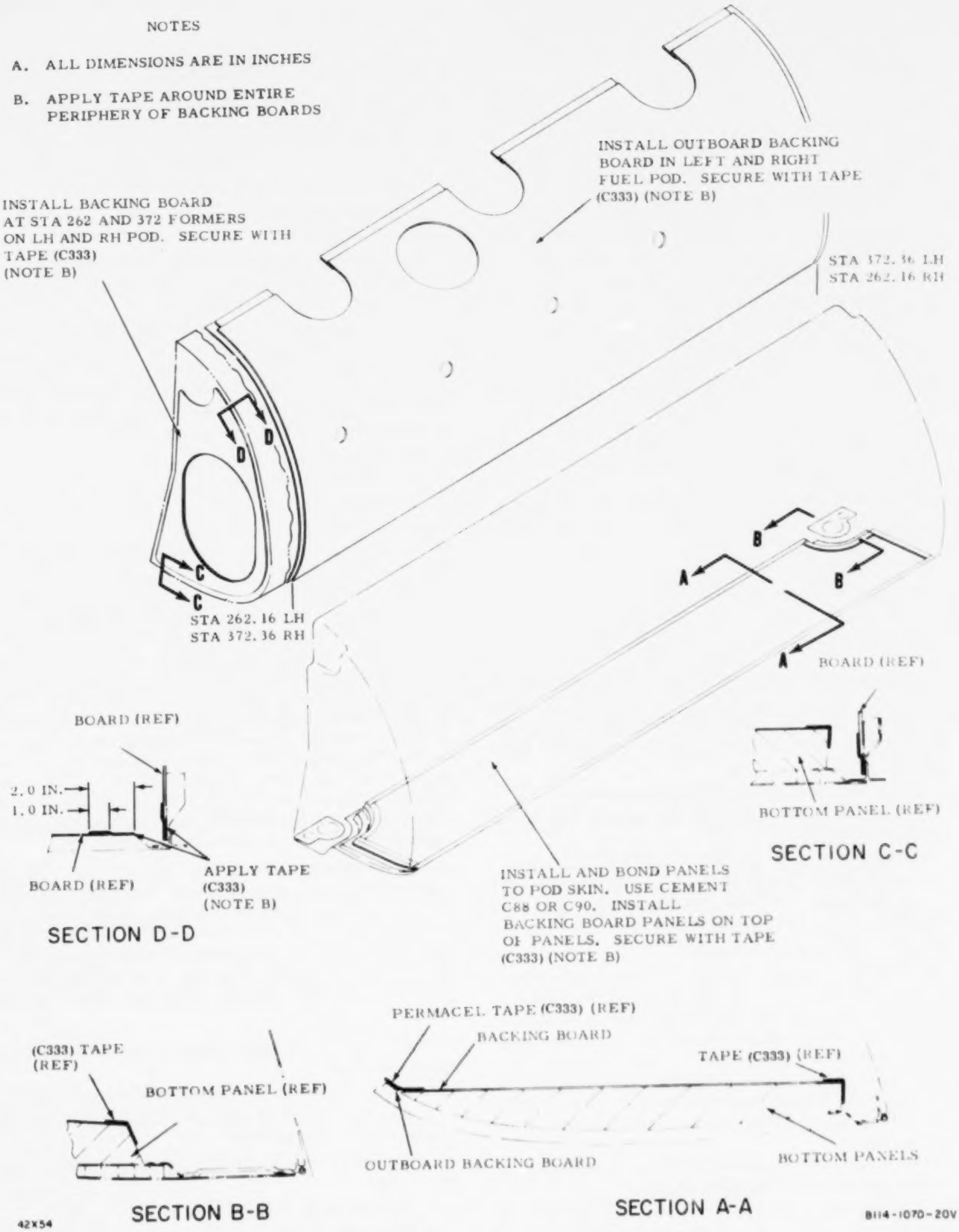
c. If an outboard or forward and aft backing board is being removed, proceed as follows:

(1) Remove the main tank.(Refer to para 10-9.)

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. APPLY TAPE AROUND ENTIRE PERIPHERY OF BACKING BOARDS

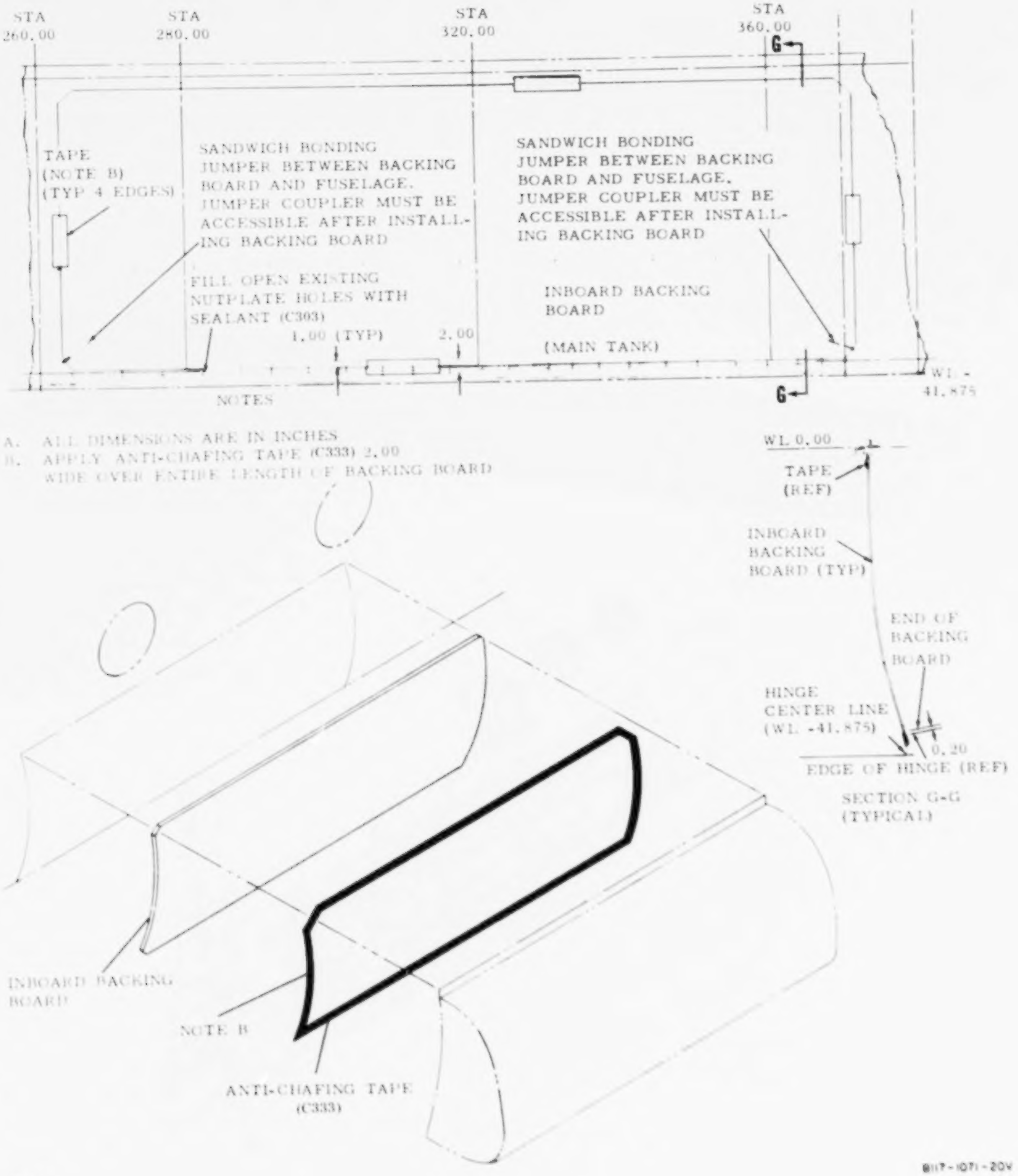

INSTALL BACKING BOARD AT STA 262 AND 372 FORMERS ON LH AND RH POD. SECURE WITH TAPE (C333) (NOTE B)

INSTALL OUTBOARD BACKING BOARD IN LEFT AND RIGHT FUEL POD. SECURE WITH TAPE (C333) (NOTE B)

INSTALL AND BOND PANELS TO POD SKIN. USE CEMENT C88 OR C90. INSTALL BACKING BOARD PANELS ON TOP OF PANELS. SECURE WITH TAPE (C333) (NOTE B)

STA 372.36 LH
STA 262.16 RH
STA 262.16 LH
STA 372.36 RH
D
D
C
C
A
A
B
B
BOARD (REF)
2.0 IN.
1.0 IN.
BOARD (REF)
APPLY TAPE (C333) (NOTE B)
SECTION D-D
BOARD (REF)
BOTTOM PANEL (REF)
SECTION C-C
(C333) TAPE (REF)
BOTTOM PANEL (REF)
SECTION B-B
PERMACEL TAPE (C333) (REF)
BACKING BOARD
TAPE (C333) (REF)
OUTBOARD BACKING BOARD
BOTTOM PANELS
SECTION A-A
42X54
B114-1070-20V

Figure 2-70. Fuel Tank Assembly Backing Board Installation—CH-47B with Crash Resistant Fuel System (Sheet 1 of 3)


STA 260.00
STA 280.00
STA 320.00
STA 360.00
G
TAPE (NOTE B) (TYP 4 EDGES)
SANDWICH BONDING JUMPER BETWEEN BACKING BOARD AND FUSELAGE. JUMPER COUPLER MUST BE ACCESSIBLE AFTER INSTALLING BACKING BOARD
SANDWICH BONDING JUMPER BETWEEN BACKING BOARD AND FUSELAGE. JUMPER COUPLER MUST BE ACCESSIBLE AFTER INSTALLING BACKING BOARD
FILL OPEN EXISTING NUTPLATE HOLES WITH SEALANT (C303)
INBOARD BACKING BOARD
(MAIN TANK)
1.00 (TYP)
2.00
WL -41.875
G
WL 0.00
TAPE (REF)
INBOARD BACKING BOARD (TYP)
END OF BACKING BOARD
HINGE CENTER LINE (WL -41.875)
0.20
EDGE OF HINGE (REF)
SECTION G-G (TYPICAL)
INBOARD BACKING BOARD
NOTE B
ANTI-CHAFING TAPE (C333)
42x50
B117-1071-20V

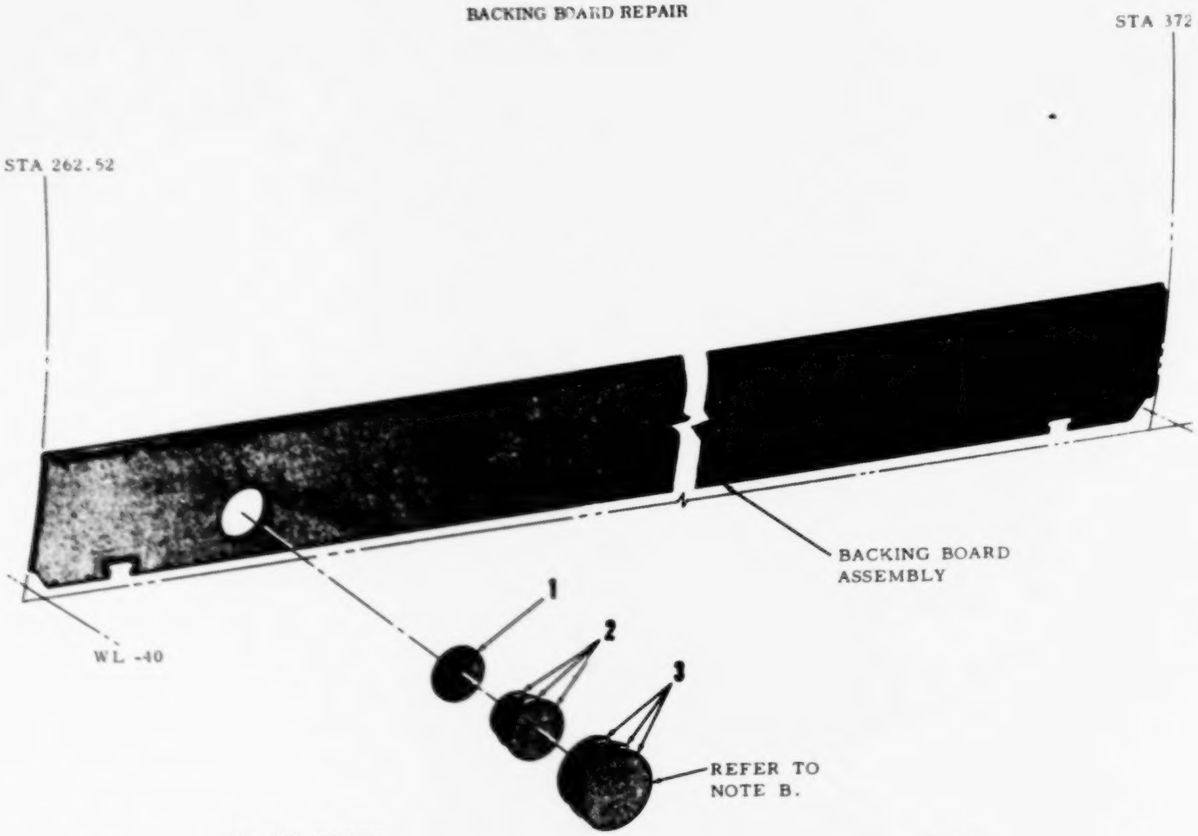
NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. APPLY ANTI-CHAFING TAPE (C333) 2.00 WIDE OVER ENTIRE LENGTH OF BACKING BOARD

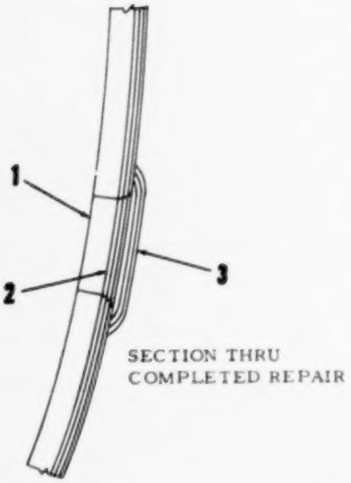
Figure 2-70. Fuel Tank Assembly Backing Board Installation—CH-47B With Crash Resistant Fuel System (Sheet 2 of 3)

BACKING BOARD REPAIR


STA 372
STA 262.52
WL -40
BACKING BOARD ASSEMBLY
1
2
3
REFER TO NOTE B.

REPAIR PARTS

1. POLYURETHANE FOAM (C157)
2. PATCHES, GLASS CLOTH (C111)
3. DOUBLERS, GLASS CLOTH (C111)



SECTION THRU COMPLETED REPAIR

NOTES

A. ALL DIMENSIONS ARE IN INCHES.
B. BOND THE PATCHES AND DOUBLERS. REFER TO TM 55-1500-204-25/1

42X48

B114-50-23V

Figure 2-70. Fuel Tank Assembly Backing Board Installation—CH-47B With Crash Resistant Fuel System (Sheet 3 of 3)

(2) Remove the anti-chafing tape from around all board edges.

(3) Remove the backing board.

2-249. Repair. Damage more extensive than that defined as negligible on impregnated glass cloth backing boards can be repaired as shown in fig. 2-70, sheet 3. Replace antichafing tape (C333) as required. Refer to para 2-586.

2-250. Installation. Install either main tank backing board as follows:

a. If an inboard backing board is being installed, proceed as follows:

(1) Clean the fuselage surface where the backing board edges make contact. Use cleaning solvent (C137.)

(2) Position the backing board against the fuselage skin. Make sure vent openings in the board and fuselage align. Apply anti-chafing tape (C333) around all board edges.

b. If an outboard or forward and aft backing board is being installed, proceed as follows:

(1) Clean the surface of the fuel pod where the backing board edges makes contact. Use cleaning solvent (C137.)

(2) Place the backing board in position in the fuel pod.

(3) Install anti-chafing tape (C333) around all board edges.

(4) Install the fuel tank. (Refer to para 10-36.)

c. Raise the tank assembly into position. (Refer to para 10-7.)

2-251. Backing Board Assembly—CH-47B Without Crash Resistant Fuel System.

(See fig. 2-71.) The backing board assembly is attached to the fuselage skin at sta 262.5 to 372.0 at wl-40. The

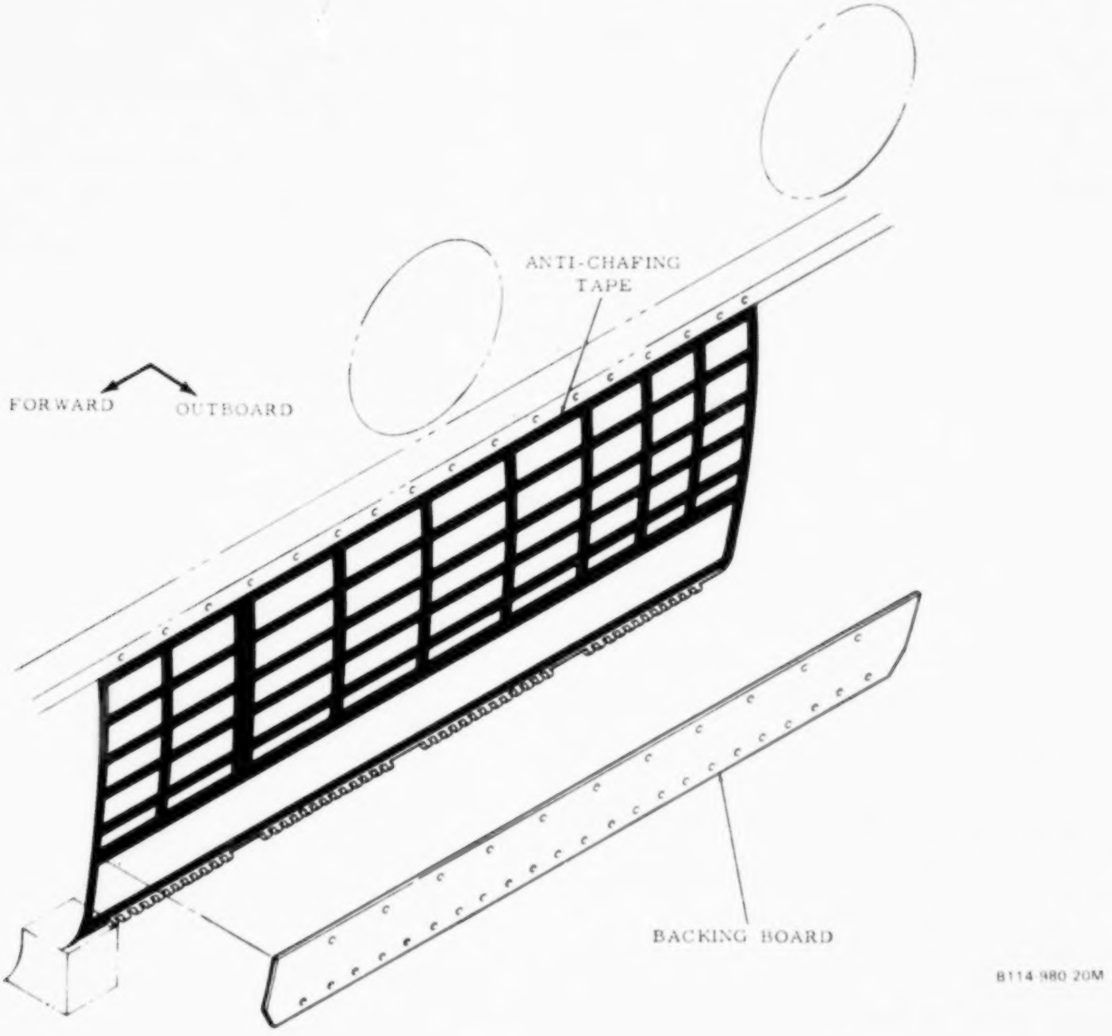


Figure 2-71. Tape and Backing Board Installation—CH-47B without Crash Resistant Fuel System

assembly consists of a polyester impregnated glass cloth bonded to a polyurethane foam sheet. Most of the backing board is of 3-ply construction. The lower 4 inches is of 13-ply construction. There are 11 laminated phenolic blocks across the top. The backing board is attached to the fuselage skin with screws. Anti-chafing tape is applied over the screw heads and board edges.

2-252. Inspection. Inspect for damage that can be repaired by a simple procedure, such as stop-drilling small cracks or burnishing scratches or dents. Extensive damage which cannot be repaired by patching necessitates replacement of the entire backing board assembly.

2-253. Removal. (See fig. 2-71.)

a. Lower the tank assembly. (Refer to para 10-41, steps a. thru l.)

b. Remove anti-chafing tape from the screw heads and board edges.

c. Remove the screws that secure the backing board.

d. Remove the backing board.

2-254. Repair. (Refer to para 2-249.)

2-255. Installation. (See fig. 2-71.)

a. Position the backing board at the bottom edge of the fuselage mating surface. Make sure the phenolic blocks are at the top.

b. Install the longer screws along the top edge. Install the shorter screws along the bottom edge.

c. Place tape over the screw heads and around all edges of the backing board. Use anti-chafing tape (C333).

d. Raise the tank assembly into position. (Refer to para 10-42, steps h. thru z.)

2-256. Backing Board Assembly— CH-47C With Crash Resistant Fuel System.

The inboard backing board assemblies are installed against the fuselage skin at sta 189.4 to 238.0, sta 262.1 to 372.4, and sta 389.9 to 438.0 at wl-40. The outboard backing boards are installed between the fuel-tank and tank pod on all tank assemblies. The inboard and outboard backing boards are held in position by anti-chafing tape applied along the edges of the boards.

2-257. Inspection. (Refer to para 2-247.)

2-258. Removal. Remove either main tank backing board as follows:

a. Lower the main tank assembly. (Refer to para 10-69, steps a. thru o.)

b. If an inboard backing board is being removed, proceed as follows:

(1) Remove the anti-chafing tape from all the board edges.

(2) Remove the backing board.

c. If an outboard backing board is being removed, proceed as follows:

(1) Remove the main tank. (Refer to para 10-84.)

(2) Remove the anti-chafing tape from all board edges.

(3) Remove the backing board.

2-259. Repair. (Refer to para 2-249.)

2-260. Installation. Install either main tank backing board as follows:

a. If an inboard backing board is being installed, proceed as follows:

(1) Clean the fuselage surface where the backing board edges make contact. Use cleaning solvent (C137.)

(2) Position the backing board against the fuselage skin. Make sure ventilator openings in the board and fuselage align. Apply anti-chafing tape (C333) around all board edges.

b. If an outboard backing board is being installed, proceed as follows:

(1) Clean the surface of the fuel pod where the backing board edges makes contact. Use cleaning solvent (C137).

(2) Place the backing board in position in the fuel pod.

(3) Apply anti-chafing tape (C333) around all board edges.

(4) Install the main fuel tank. (Refer to para 10-93.)

c. Raise the main tank into position. (Refer to para 10-71, steps e. thru r.)

2-261. Backing Board Assemblies— CH-47C Forward and Aft Auxiliary Fuel Tanks.

The backing board assemblies for the auxiliary fuel tanks are similar in construction and material to the backing boards for the main tanks. Refer to para 2-256.

2-262. Inspection. Refer to para 2-247.

2-263. Removal. Remove either forward or aft auxiliary fuel tank backing board as follows:

a. Lower the forward or aft auxiliary fuel tank assemblies. (Refer to para 10-77.)

b. If an inboard backing board is being removed, proceed as follows:

(1) Remove the anti-chafing tape from the board edges.

(2) Remove the inboard backing board.

c. If an outboard backing board is being removed, proceed as follows:

(1) Remove the forward or aft fuel tanks. (Refer to para 10-96.)

(2) Remove the anti-chafing tape from the board edges.

(3) Remove the outboard backing board.

2-264. Repair. Refer to para 2-249.

2-265. Installation. (See fig. 2-70.) Install the forward or aft backing board assemblies as follows:

a. Position the backing boards at the bottom of the fuselage mating surface. Make sure the phenolic blocks are at the top.

b. Install the longer screws along the top edge. Install the shorter screws along the bottom edge.

c. Place tape over the screw heads and around all edges of the backing board. Use anti-chafing tape (C333).

d. Raise the forward or aft auxiliary tank assemblies into position. (Refer to para 10-79.)

2-266. *Fuel Tank Isolation Panel Assemblies.*

See fig. 2-72. The isolation panel assemblies are used on helicopters 67-18494 and subq and are attached to the pod skin between sta 189.41 and 238.0, 262.16 and 372.36, and 389.91 and 438.50. A typical panel assembly consists of a sandwich honeycomb panel with laminated glass cloth skins and a nonmetallic honeycomb core. A skin is primarily of two-ply construction with six plies at the outer edges. The upper and lower surfaces of the panel assembly are covered with a transparent Tedlar film bonded to the glass cloth surface. All panel assemblies are supported by vibration isolators. A typical vibration isolator is an assembly of rubber and nylon bonded to an aluminum alloy extrusion. The panel assemblies are hinged to the pod skin and at a point approximately 3 inches inboard. Antichafing tape is applied over the heads of all screws and fasteners.

2-267. Fuel Tank Isolation Panel—CH-47C With Crash Resistant Fuel System. (See fig. 2-72 and 2-73.) A fuel tank isolation panel is at the bottom of each pod structure. The panel rests on isolators and is attached to the pod structure by straps and a double hinged panel. The fuel tank rests on the isolation panel. The panels are similar in construction and shape on all helicopters. The isolation panels fit around the tank drain valve adapters. A backing board is positioned over the hinge assembly. Refer to para 2-256.

2-268. Inspection. Inspect the fuel tank isolation panel when a fuel tank has been removed from the fuel pod. Proceed as follows:

a. Remove the fuel tank assembly lower backing board by removing the anti-chafing tape from along the board edges.

b. Inspect the isolation panel for cracks, deterioration, and security.

c. Check the panel for any separation from the fuel pod structure.

d. Extensive damage to the sandwich honeycomb structure which cannot be repaired necessitates replacement of the entire isolator panel assembly. Vibration isolators are not reparable and if damaged, must be replaced. Deterioration of edge strip requires replacement. One or more layers of silicone rubber (C285) can be used provided a thickness of 0.125 inch is maintained.

2-269. Removal. Remove the isolation panel from a main, forward auxiliary or aft auxiliary pod structure as follows:

a. Remove the fuel tank. (Refer to para 10-84 or 10-96.)

b. (See fig. 2-72.) Remove screws (4) and washers (5) securing straps (3) to panel (2).

c. Remove screws (6) and washers (7) securing straps (8) to the panel.

d. Remove screws (11) and washers (12) securing hinge (13) to pod structure (12).

e. Remove the isolation panel from the pod structure.

2-270. Repair. (See fig. 2-74.) Refer to TM 55-1500-204-25/1 for damage classifications for sandwich honeycomb parts. Damage more extensive than that defined as negligible can be repaired. Replace antichafing tape (C333) as required. Refer to para 2-586.

2-271. Installation. Install the isolation panel in a main, forward auxiliary, or aft auxiliary pod structure as follows:

a. (See fig. 2-72.) Position panel (2) in the pod. Route straps (8) thru gaps in hinge (9).

b. Secure straps (8) to the panel. Use screws (6) and washers (7).

c. Align the holes in hinge (13) with those in pod structure (10). Install screws (11) and washers (12).

d. Secure straps (3) to the panel. Use screws (4) and washers (5).

e. Install the fuel tank. (Refer to para 10-93 or 10-105.)

2-272. *Fuel Pod Venting.*

(See fig. 2-75.) Fuel pod venting is accomplished on CH-47C helicopters thru five vent ducts installed on each side of the cabin section. One end of each duct is open to the bottom interior of the fuel pods. The other end of the ducts vent out just above the fuel pods into the area under the fuel pod fairing, except one which vents behind the forward landing gear door. The main fuel tank pod has three vents, one at each end at stations 254 and 350 and one in the center of sta 323. The forward auxiliary fuel pod is vented at its aft end at sta 235, while the aft auxiliary fuel pod is vented at its forward end at sta 403.

2-273. Inspection of Vent Ducts. (See fig. 2-75.)

a. Inspect each vent duct opening for obstructions.

b. Inspect the vent ducts for damage.

2-274. Replacement of Vent Ducts. (See fig. 2-75.)

a. To replace bottom section of ducting, remove flooring as necessary. (Refer to para 2-336.)

b. Before installation, clean mating surfaces of ducts with naphtha (C218).

c. Apply sealant (C301) to mating surfaces of ducts during installation. Use sealant (C301) to close each opening in the floor where ducting passes thru.

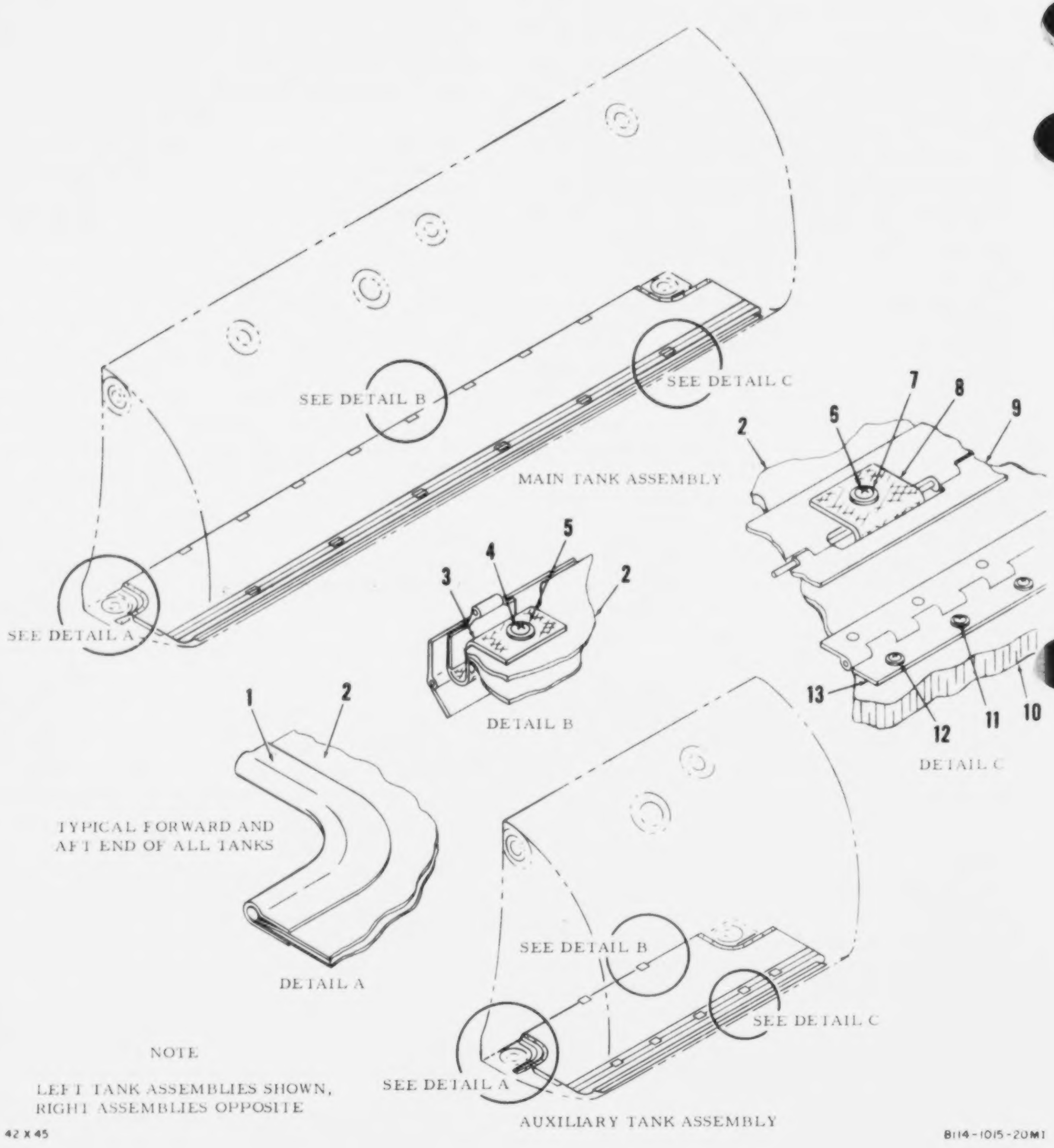
2-275. *Rescue Hatch Lower Door.*

(See fig. 2-76.) The mechanically operated rescue hatch lower door (14) is located in the fuselage rescue hatch, between sta 320 and 360. A rescue hatch door (1) in the cabin floor provides access to the lower door. The rescue hatch lower door is of sandwich honeycomb construction. A rail, consisting of six pieces of aluminum alloy square drawn tubing welded together, is bonded to the door edges and forms the door flange. An oval recess is provided in the left side of the door for cargo hook stowage.

NOTE

> On helicopters with MWO 55-1500-204-30-1 a locking device is installed which secures the inside rescue hatch door to existing cargo tie-down rings.

a. The lower door is secured in the closed position by four latches (7). These latches are operated by an actuator


SEE DETAIL B
SEE DETAIL C
MAIN TANK ASSEMBLY
SEE DETAIL A
3
4
5
2
DETAIL B
2
6
7
8
9
13
12
11
10
DETAIL C
1
2
TYPICAL FORWARD AND AFT END OF ALL TANKS
DETAIL A
SEE DETAIL B
SEE DETAIL C
SEE DETAIL A
AUXILIARY TANK ASSEMBLY
42 X 45
8114-1015-20M1

NOTE

LEFT TANK ASSEMBLIES SHOWN, RIGHT ASSEMBLIES OPPOSITE

1. Edge member
2. Panel
3. Strap
4. Screw
5. Washer
6. Screw
7. Washer
8. Strap
9. Hinge
10. Pod structure
11. Screw
12. Washer
13. Hinge

Figure 2-72. Fuel Tank Isolation Panel Installation— CH-47C with Crash Resistant Fuel System

(16) on the forward center section of the door and connecting links (15) which are connected between the actuator and the latches. A crank handle for operating the door and the latches is stowed on the left side of the cabin at sta 340. The latches are released by connecting the crank handle to latch actuator (16) and turning the handle clockwise.

b. The door is opened by connecting the crank handle to the actuator (9) of the opening mechanism at the aft end of the hatch. The door is connected to parallel linkage. When opened, the door maintains a position parallel to the cabin floor, swinging down, aft, and up to a location between sta 360 and 400.

2-276. *Inspection of Rescue Hatch Lower Door and Actuator.* Inspect for the following conditions.

a. Cracks, distortion, loose or missing rivets, seal deterioration.

b. Lower door for freedom of operation and closure.

c. Lower door gearbox actuator for leakage, corrosion, and specified fluid level in sight gage (if installed).

d. Hand crank for proper storage.

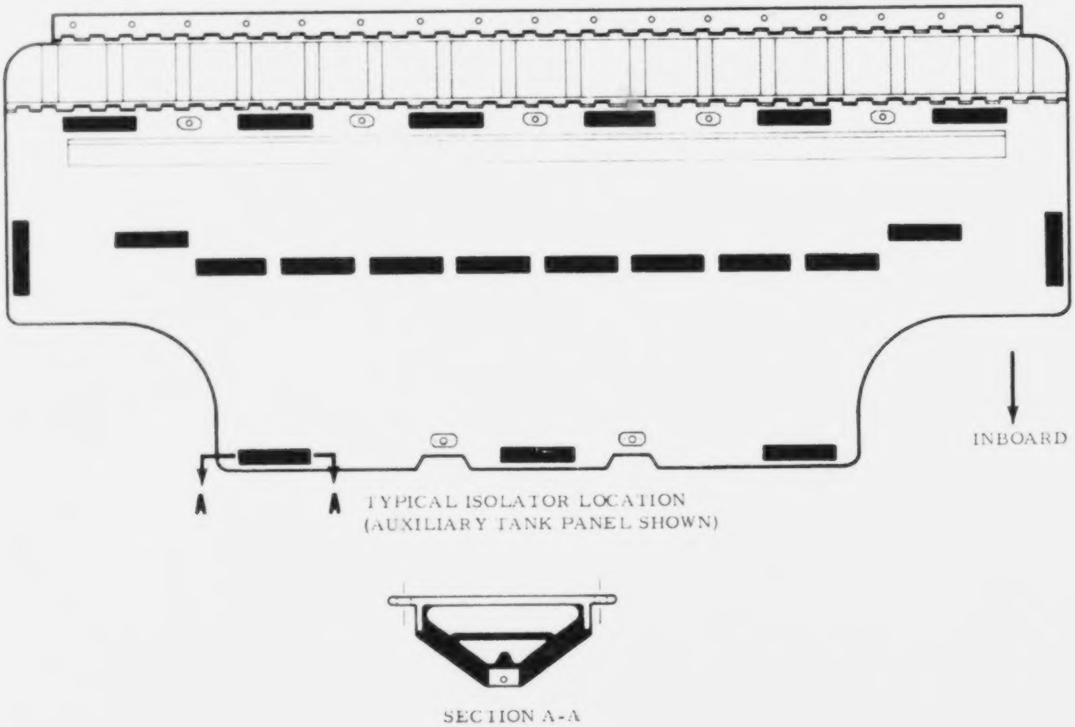
e. Upper door for freedom of operation and positive locking and closure.

2-277. *Removal.* (See fig. 2-76.)

a. Open the floor rescue hatch door (1). Release the latch actuator (16) by hand. Crank the actuator (9) until the lower door (14) is at its lowest position.

CAUTION

Make sure that the latches (7) are disengaged before operating the door actuator (9).



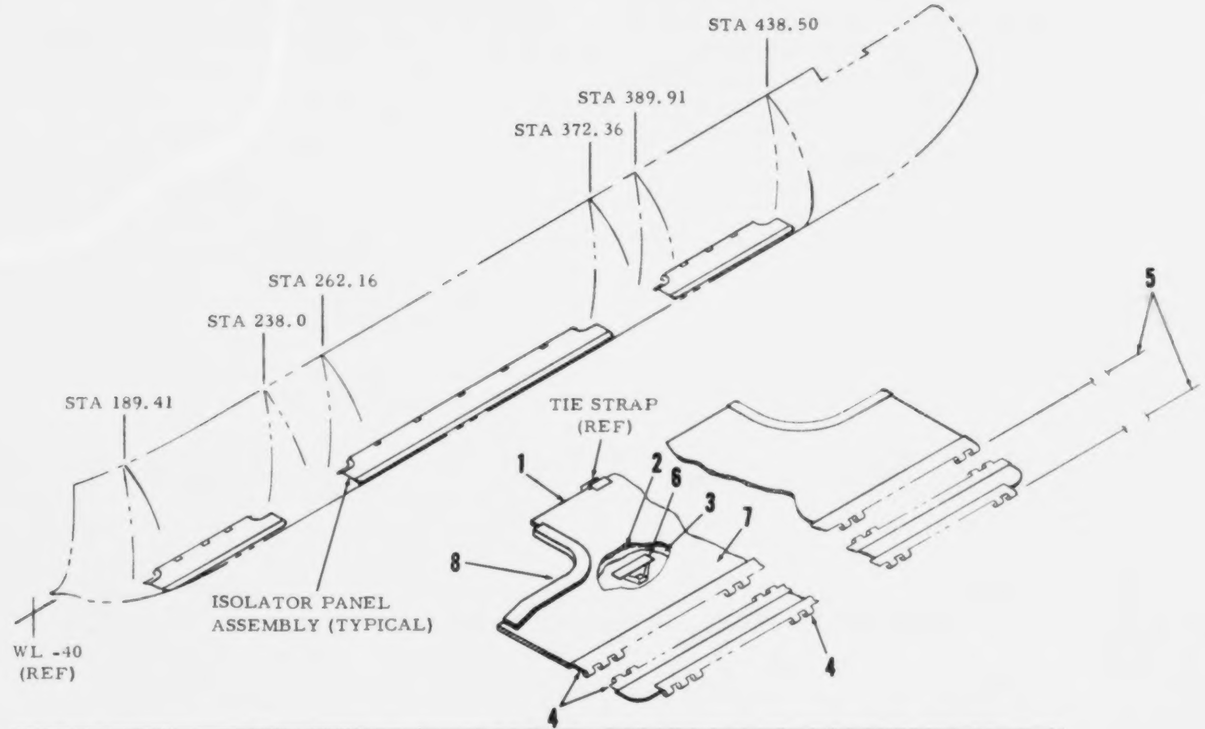
ISOLATOR LOCATION

PANEL	ISOLATORS PER PANEL
AUXILIARY TANK (FORWARD OR AFT)	21
MAIN TANK	49

42x40

8114-1014-20MI

Figure 2-73. Isolator Locations, Fuel Tank Isolation Panel—CH-47C with Crash Resistant Fuel System


STA 438.50
STA 389.91
STA 372.36
STA 262.16
STA 238.0
STA 189.41
TIE STRAP (REF)
1
2
6
3
7
8
5
4
4
ISOLATOR PANEL ASSEMBLY (TYPICAL)
WL -40 (REF)

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	UPPER SKIN	2-PLY, NO. 181 GLASS CLOTH	NOTE B.
2	CORE	8. 1-1/8 x 20N 3003 MIL-C-7438	NOTE B.
3	LOWER SKIN	2-PLY, NO. 181 GLASS CLOTH	NOTE B.
4	HINGE HALF	MS20001 PH5-5500	NOTE C.
5	HINGE PIN	MS20253-2-5500	NOTE C.
6	ISOLATOR	6963-T6	NOTE D.
7	FILM	TEDLAR FILM,	NOTE E.
8	EDGE MEMBER	6-PLY, NO. 181-150 GLASS CLOTH	NOTE F.

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO TM 55-1500-204-25/1 FOR REPAIRS TO SANDWICH HONEYCOMB STRUCTURE
C. REPLACE HINGE HALF WITH HINGE MS20001PH5-5000 AND PIN MS20253-2-5500
D. IF DAMAGE IS OTHER THAN NEGLIGIBLE, REPLACE WITH NEW ISOLATOR 114SS674-1
E. TEDLAR FILM (C355) IS BONDED TO UPPER AND LOWER SURFACES OF ISOLATOR PANELS. INFORMATION FOR BONDING AND PATCHING TEDLAR FILM WILL BE PROVIDED WHEN AVAILABLE
F. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIRS TO GLASS CLOTH

42x51

B114-449-34S V

Figure 2-74. Isolation Panel Repairs, Pod Installation—CH-47C Cabin Fuselage Structure Assembly

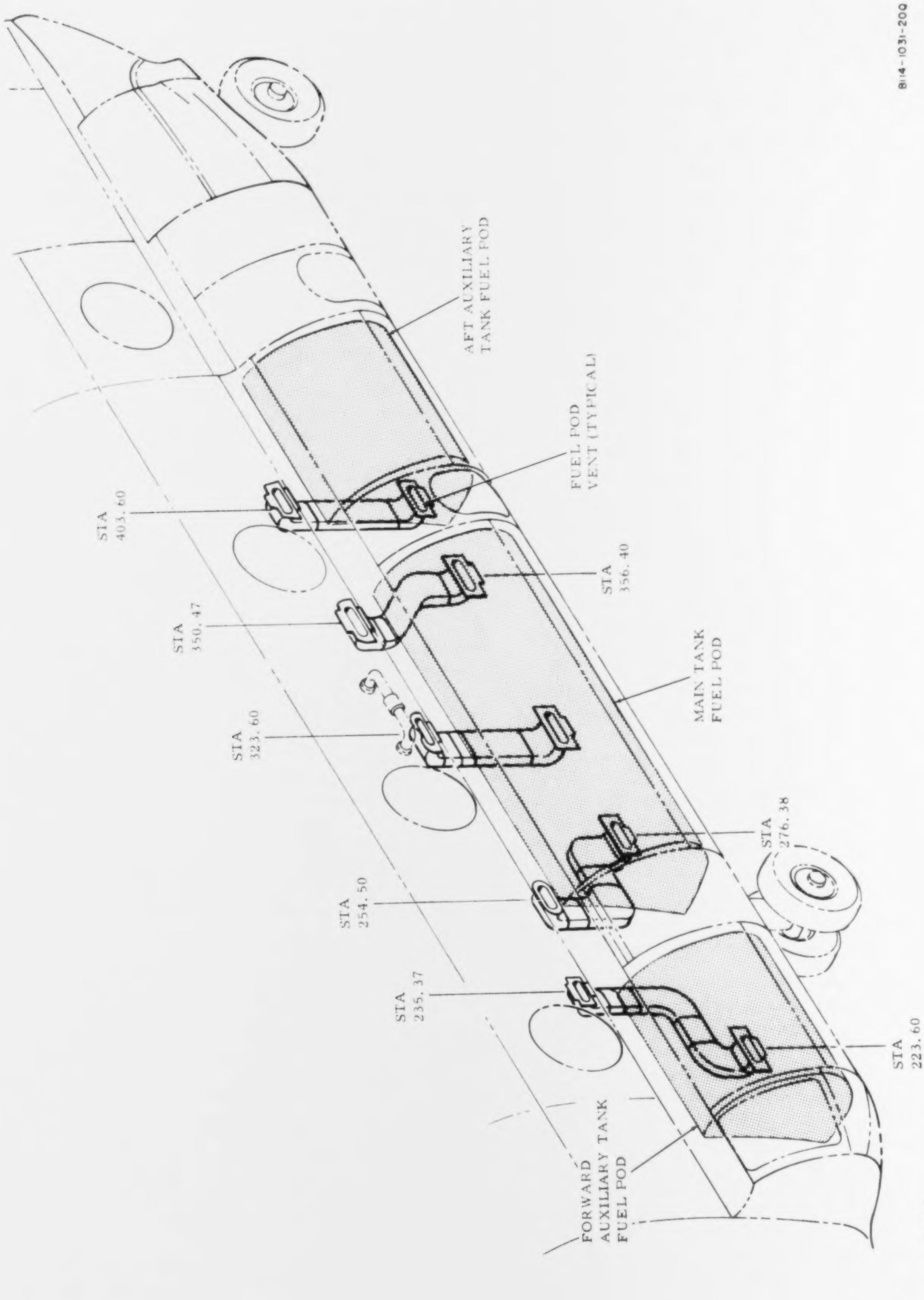
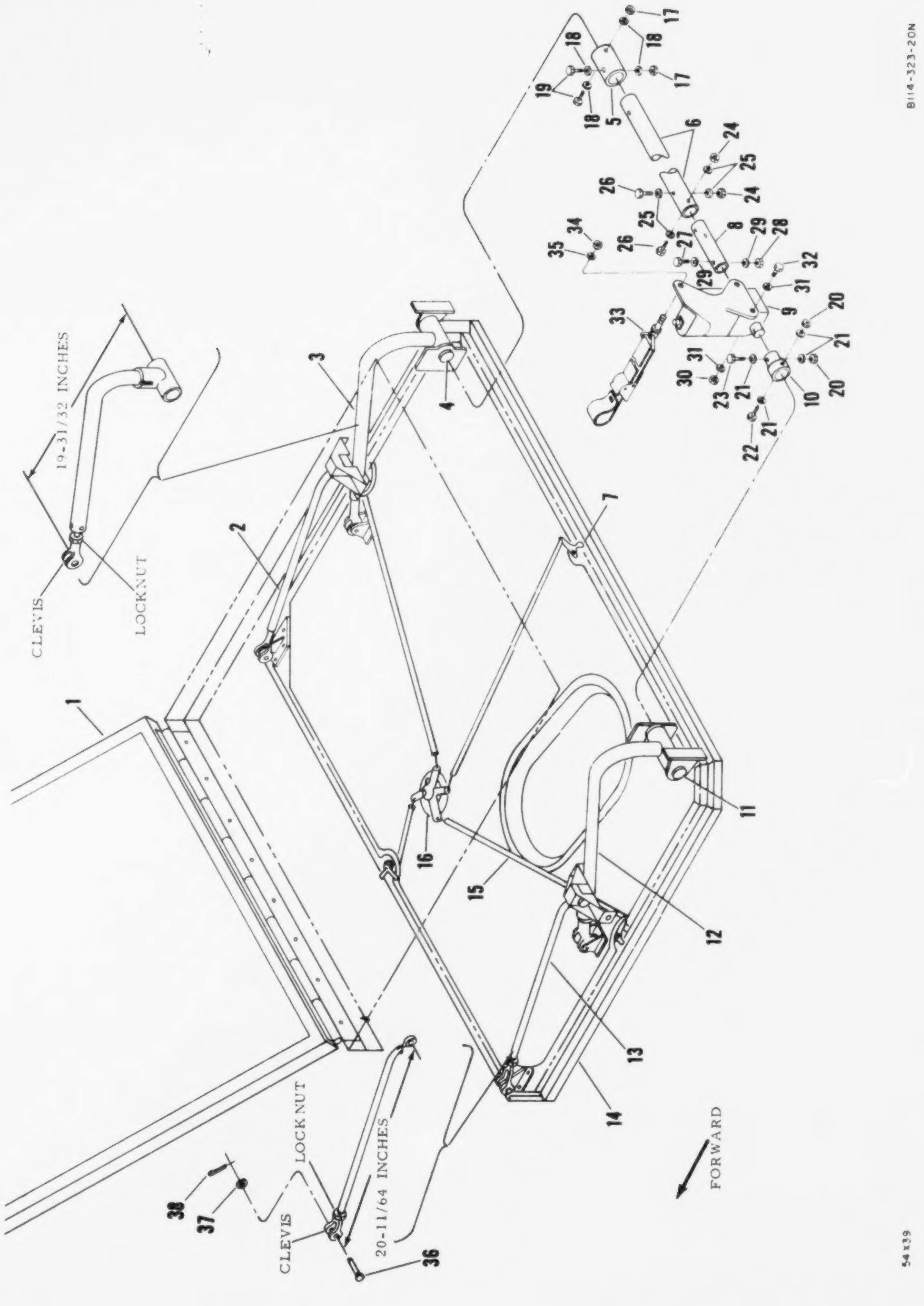

814-1031-200
AFT AUXILIARY TANK FUEL POD
FUEL POD VENT (TYPICAL)
STA 403.60
STA 356.40
STA 350.47
MAIN TANK FUEL POD
STA 323.60
STA 276.38
STA 254.50
STA 235.37
STA 223.60
FORWARD AUXILIARY TANK FUEL POD
54x39

Figure 2-75. Fuel Pod Venting


B114-323-20N
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26
34
35
29
32
31
9
33
20
21
31
30
23
21
20
10
22
21
3
4
19-31/32 INCHES
CLEVIS
LOCKNUT
2
7
1
16
11
15
12
13
14
FORWARD
LOCK NUT
20-11/64 INCHES
38
37
CLEVIS
36
54x39

Figure 2-76. Rescue Hatch Lower Door and Actuating Mechanism

b. Support the door (14). Disconnect the idler link assemblies (2 and 13) and actuating link assemblies (3 and 12) from the brackets on the door. Remove the door.

*2-278. **Repair.*** (See fig. 2-76.)

a. Damage which can be permitted to exist as is or can be repaired by a simple procedure, such as stop-drilling small cracks or burnishing scratches or dents, is negligible.

b. (AVIM). Refer to TM 55-1500-204-25/1 for damage classifications of, and repairs to, sandwich honeycomb sections. Extensive damage to the sandwich honeycomb sections which cannot be repaired or damage to the rails other than negligible, necessitates replacement of the entire door or rail.

*2-279. **Installation.*** (See fig. 2-76.)

a. Position the rescue hatch lower door (14) in the hatch area. Center the door in relation to the coaming.

CAUTION

To prevent damage to the rescue hatch lower door, make sure that the cargo hook is correctly stowed and supported by the retaining strap.

b. Connect actuating link assembles (3 and 12) to the lower door.

CAUTION

During closing operation, do not exert over 50 pound-inches of torque at the crank handle. Otherwise, damage to the gearbox can result.

c. Slowly crank the door towards the closed position until door latches (7) begin to engage the striker plates in the fuselage.

d. Check that the door is centered in the opening. Check for clearance between each latch (7) and each striker plate. If required, adjust the rod ends of door actuating links (3 and 12) to center the door. Adjust the rod ends of latch connecting links (15) to obtain clearance between latches (7) and the striker plates.

e. Check the door position for uniform closing while slowly cranking the actuator toward the door-closed position. If necessary, adjust the rod ends of door actuating link assemblies (3 and 12) to provide proper closure.

f. Recheck the door operation by cranking the door open, then closed. The door shall fully close with a maximum of 50 pound-inches of torque applied to the gearbox shaft input shaft during closure.

g. Crank latch actuator (16) to the locked position.

2-280. Rescue Hatch Lower Door Latch Actuator.

(See fig. 2-76.) The latch actuator (16) is mounted on the inside forward section of the door (14). It consists of a base ring, an actuator, a shim, a cam, a lever, a spring, and a retainer pin. The retainer pin also serves as an attaching part for the actuator.

*2-281. **Inspection.*** Refer to para 2-276.

*2-282. **Removal.*** (See fig. 2-76.)

a. Open the floor rescue hatch door (1). Release the latch actuator (16).

CAUTION

Make sure that the latches (7) are disengaged before operating the door actuator (9).

b. Open the rescue hatch lower door (14) until the door is in its lowest position.

c. Disconnect the connecting links (15) from the arms of the latch actuator (16) by removing the attaching bolts, nuts, and washers.

d. Remove the cotter pin which secures the cam to the retainer pin. Disconnect the cam from the pin.

e. Remove the retainer pin and washer and the two screws and washers which secure the latch actuator to the door. Remove the latch actuator.

*2-283. **Replacement of Latch Connecting Link.*** (See fig. 2-76.) Replace any one of the connecting links (15) as follows:

CAUTION

Make sure that the latches (7) are disengaged before operating the door actuator (9).

a. Open the floor rescue hatch door (1). Release the latch actuator (16). Open the rescue hatch lower door (14) until the door is at its lowest position.

b. Remove the bolt, nut, and washer from each end of the connecting link (15). Remove the link. Measure the length of the link from center-to-center of the mounting holes. Record the dimension.

c. Adjust the replacement link to the same length as the removed link.

d. Position the replacement link (15) between the latch actuator arm and the latch. Install the bolt, nut, and washer. Secure them with a cotter pin.

e. Close the door (14). (Refer to para 2-279, steps f. and g.) Check the latching mechanism for proper operation.

Legend for figure 2-76

1. Floor rescue hatch door
2. Idler link assembly
3. Actuating link assembly
4. Drive shaft
5. Coupling
6. Drive shaft
7. Latch
8. Coupling
9. Actuating gear box
10. Coupling
11. Drive shaft
12. Actuating link assembly
13. Idler link assembly
14. Rescue hatch lower door
15. Latch connecting link
16. Latch actuator
17. Nut
18. Washer
19. Bolt
20. Nut
21. Washer
22. Bolt
23. Bolt
24. Nut
25. Washer
26. Bolt
27. Bolt
28. Nut
29. Washer
30. Nut
31. Washer
32. Bolt
33. D-ring
34. Nut
35. Washer
36. Pin
37. Washer
38. Cotter pin

2-284. Replacement of Latch. (See fig. 2-76.) Replace any one of the latches on the rescue hatch lower door as follows:

CAUTION

Make sure that the latches (7) are disengaged before operating the door actuator (9).

a. Open the floor rescue hatch door (1). Release the latch actuator (16). Open the rescue hatch lower door until the door is in its lowest position.

b. Remove the bolt, nut, and washer attaching the connecting link (15) to the latch (7).

c. Remove the three screws and washers which secure the latch fitting to the door. Remove the fitting.

d. Remove the bolt, nut, and washer which secure the latch to the fitting. Remove the latch.

e. Position the replacement latch (7) on the fitting. Install the bolt, nut, and washer (one under the head and one under the nut). Make certain that the bolt head is in the recess of the fitting. Install a cotter pin.

2-285. Installation. (See fig. 2-76.)

a. Position the latch actuator (16) on the door. Make sure that the latch actuator arm, which contains the spring, is pointed to the left and forward. Make sure that the mounting holes are aligned.

b. Install the mounting screws and the retainer pin and washers.

c. Position the slot of the cam on the latch actuator shaft. Secure the cam to the retainer pin with the cotter pin and washer.

d. Attach the connecting links (15) to the latch actuator arms with the bolts, nuts, and washers. Install cotter pins.

e. Close the door. (Refer to para 2-279, steps f. and g.) Check the latching mechanism for proper operation.

f. Position the fitting on the door. Make sure that the short arm of the latch is toward the edge of the door. Install the attaching screws and washers.

g. Attach the connecting link (15) to the latch with the bolt, nut, washer, and cotter pin.

h. Close the door (14). (Refer to para 2-279, steps f. and g.) Check the latching mechanism for proper operation.

2-286. Rescue Hatch Lower Door Actuating Gear Box

(See fig. 2-76.) The actuating gear box and mechanism is mounted to the fuselage structure at the aft side of the hatch opening.

a. The lower rescue hatch door actuating mechanism consists of an actuating gear box, three drive shafts, three couplings, two actuating link assemblies, and two idler link assemblies.

b. The three drive shafts, interconnected thru the couplings, extend from the actuator to brackets mounted on the left and right sides of the hatch. The actuating links are secured by bolts to the shaft and to brackets on the door. The idler links are connected by bolts to brackets on the structure and on the door.

c. The actuating gear box is a mechanical device with a worm and gear type system.

d. The 114S2623-6 actuating gear box has a sight gage installed in the side of the housing for checking the oil level. A filler plug is installed in the upper section of the housing for oil replenishment. When the 114S2623-6 gear box requires servicing, a change from oil to grease lubrication shall be implemented. Refer to para 2-293.

2-287. Inspection of Lower Hatch Door Actuating Gear Box and Mechanism. (See fig. 2-76.) Inspect for the following conditions:

a. Mechanism for security.

b. Connecting shafts and links for security.

c. Gear box actuator 114S2623-6 (9) for security, leakage, corrosion and specified fluid level in sight gage.

d. Gear box actuator 114S2623-3 and 114S2623-8 (9) for security, leakage and corrosion.

2-288. Removal. (See fig. 2-76.)

a. Remove the floor rescue hatch lower door (1). (Refer to para 2-277.)

b. Remove the access plate in the fuselage immediately aft of the rescue hatch.

c. Remove the nuts (17), washers (18), and bolts (19) which secure the coupling (5) to the drive shaft (4).

d. Remove the nuts (20), washers (21), and bolts (22 and 23) which secure the coupling (10) to the actuator (9) and to the drive shaft (11).

e. Remove the nuts (24 and 28), washers (25 and 29), and bolts (26 and 27) which secure the coupling (8) to the actuator (9) and to the drive shaft (6).

f. Remove the nuts (30), washers (31), bolts (32), and D-ring (33) which secure the actuator to the fuselage former.

g. Telescope the coupling (8) into the shaft (6). Slide the actuator (9) to the right to disengage the actuator gear shaft from the coupling (10). Withdraw the actuating gear box.

2-289. Disassembly (AVIM). (See fig. 2-77.) Disassemble the actuating gear box as follows:

a. If actuating gear box 114S2623-6 is to be disassembled, remove filler plug (1), washer (2), sight plug (3), and packing (4). Drain the lubricating oil into a suitable container.

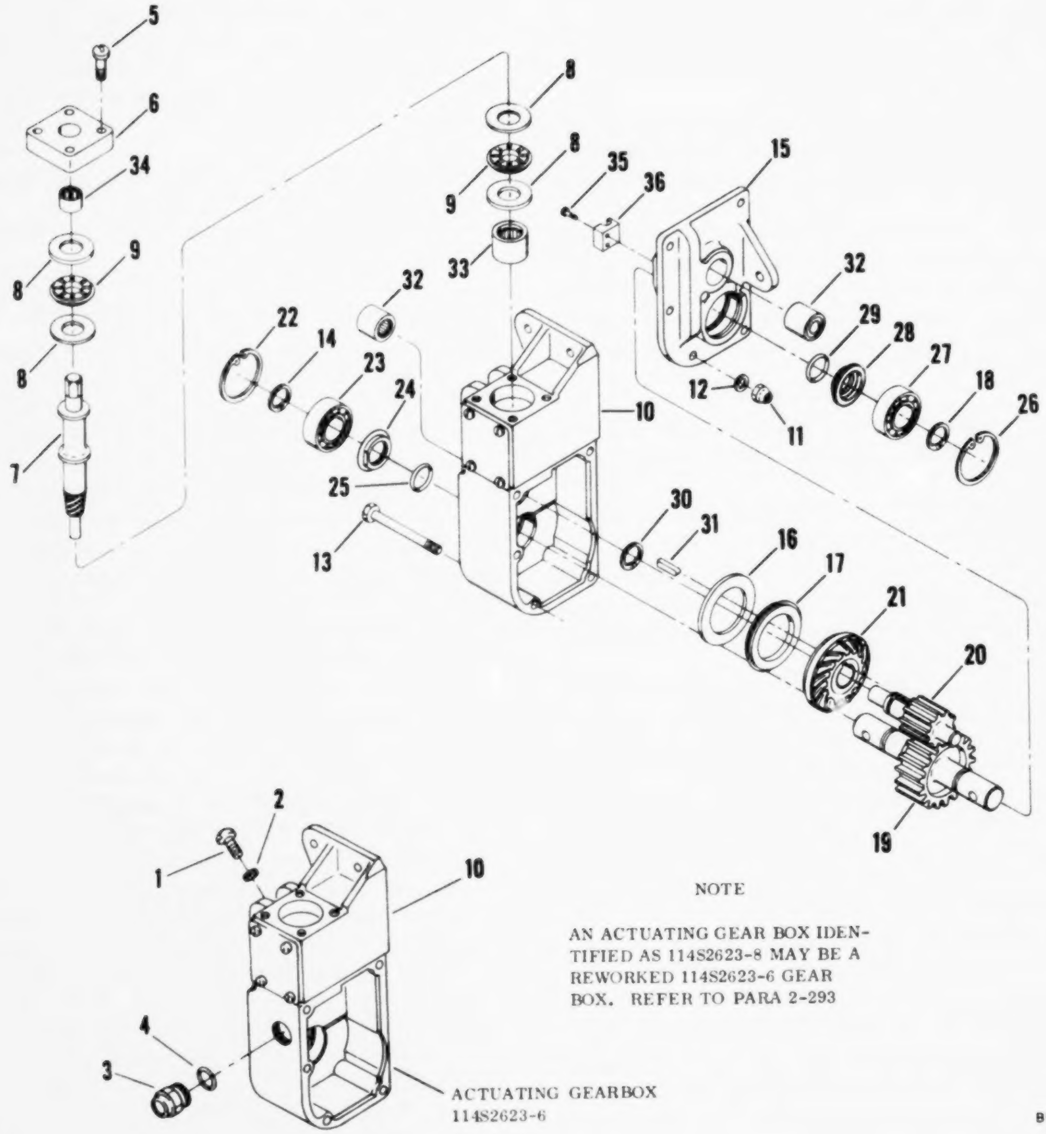
b. Remove lockwire from screws (5) on 114S2623-3 actuating gear box.

c. Remove screws (5) and thrust cap (6). Remove spiroid pinion (7), thrust washers (8), and thrust bearings (9) from housing (10). For actuating gear box 114S2623-3, drain lubricating oil into a suitable container.

d. Remove nuts (11), washers (12), and bolts (13). Remove retaining ring (14) from spur gear shaft.

e. Remove cover (15), complete with spur gear and pinion (19 and 20), and spiroid gear (21), from the housing.

f. Remove thrust washer (16) and bearing (17) from spiroid gear (21).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16
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1
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3
ACTUATING GEARBOX
114S2623-6
42x40
B114-164-34V

NOTE

AN ACTUATING GEAR BOX IDENTIFIED AS 114S2623-8 MAY BE A REWORKED 114S2623-6 GEAR BOX. REFER TO PARA 2-293

1. Filler plug
2. Washer
3. Sight plug
4. Packing
5. Screw
6. Thrust cap
7. Spiroid pinion
8. Thrust washer
9. Thrust bearing
10. Housing
11. Nut
12. Washer
13. Bolt
14. Retaining ring
15. Cover
16. Thrust washer
17. Thrust bearing
18. Retaining ring
19. Spur gear
20. Spur pinion
21. Spiroid gear
22. Retaining ring
23. Ball bearing
24. Seal
25. Packing
26. Retaining ring
27. Ball bearing
28. Seal
29. Packing
30. Retaining ring
31. Key
32. Roller bearing
33. Roller bearing
34. Roller bearing
35. Screw
36. Bearing support

Figure 2-77. Rescue Hatch Lower Door Actuating Gear Box 114S2623-3, 114S2623-6 And 114S2623-8

CAUTION

The spiroid gear rides in a machined groove in the spur gear shaft. Any attempt to remove assembled spiroid gear and spur pinion from cover, with spur gear installed, can result in damage to components.

g. Remove retaining ring (18). Remove spur gear (19), pinion (20), and spiroid gear (21) as an assembly from cover. Separate the assembled spur pinion and spiroid gear from spur gear.

h. Remove retaining ring (22) and ball bearing (23) from housing (10). Remove seal (24) complete with packing (25) from the housing.

i. Remove retaining ring (26) and ball bearing (27) from cover (15). Remove seal (28) complete with packing (29) from the cover.

NOTE

Further disassembly is not required unless other parts are noticeably damaged or worn. (Refer to para 2-291.)

j. If required, remove retaining ring (30) and spiroid gear (21) from the spur pinion shaft. Retain key (31).

k. If required, remove bearings (32, 33, and 34) from the housing and cover. (Refer to TM 55-1500-322-25.)

l. If required, remove screws (35) and bearing support (36) from the cover.

2-290. Cleaning (AVIM). Clean all disassembled parts. Use solvent (C137). Dry the parts with clean lint-free cloths (C104) or low pressure compressed air. Additional information and procedures are included in TM 55-1500-333-24.

2-291. Inspection (AVIM). (See fig. 2-77.)

a. Inspect component parts under a strong light, preferably under magnification. Check for cracks, nicks, burrs, corrosion, or any condition that could cause component malfunction. Replace defective components.

NOTE

Housing (10) and cover (15) are a matched set. If either part is rejected, replace both parts.

b. Inspect the gears. Check gear teeth for cracks, wear, nicks, or fractures. Replace defective components.

NOTE

Spiroid gear (21) and spiroid pinion (7) are a matched set. If either part is rejected, replace both parts.

c. Inspect all bearings. (Refer to TM 55-1500-322-25.) Replace defective bearings.

d. Inspect spiroid pinion (7), spur pinion (20), and spur gear (19) for wear. Replace defective components.

NOTE

Spiroid pinion (7) and spiroid gear (21) are a matched set. If the pinion is replaced, replace the spiroid gear.

2-292. Lubrication (AVIM). (See fig. 2-77.) Pack bearings (23, 27, 33, and 34) with grease (C165). (Refer to TM 55-1500-322-25.)

2-293. Actuating Gear Box 114S2623-6 Modification (AVIM). Actuating gear box 114S2623-6 may be reworked by removing lubricating oil (C228) or Shell Spirax EP 90 oil and grease (C165). Flush with solvent (C136) and refill chambers with grease (C164). Paint over sightglass (114S2892-3) and reidentify the actuating gear box as 114S2623-8. Stamp the nameplate with the new part number.

2-294. Assembly (AVIM). (See fig. 2-77.) Reassemble the actuating gear box as follows:

a. If required, install bearing support (36) in cover (15). Install screws (35).

b. If required, install bearings (32, 33, and 34) in cover, housing (10), and thrust cap (6). (Refer to TM 55-1500-322-25.)

c. If required, install the spiroid gear on the spur pinion shaft as follows:

(1) Locate key (31) in spur pinion shaft keyway.

(2) Align the keyway in the spiroid gear bore with the shaft key. Install spiroid gear (21) on the shaft.

(3) Install retaining ring (30).

d. Apply adhesive (C32) to mating surfaces of seal (28) and cover. Install a new packing (29) in the seal. Install the seal in the cover.

e. Install bearing (27) in the cover with its dust shield to the outside. Install retaining ring (26).

f. Apply adhesive (C32) to mating surfaces of seal (24) and the housing. Install new packing (25) in the seal. Install the seal in the housing. Make sure the flat on the seal is positioned to provide clearance for thrust washer (16).

g. Install bearing (23) in the housing with its dust shield to outside. Install retaining ring (22).

h. Check and adjust backlash between spiroid pinion (7) and spiroid gear (21) as follows:

(1) Install bearing (17) and thrust washer (16) on spiroid gear. Locate spur pinion shaft end in housing bearing (32). Make sure thrust washer (16) is in contact with housing.

(2) Install thrust washers (8), thrust bearings (9), and spiroid pinion (7) in the housing. Install thrust cap (6). Install screws (5).

(3) Temporarily install cover (15), bolts (13), washers (12), and nuts (11).

(4) Hold spiroid pinion (7). Check spiroid gear (21) for backlash. The spiroid gear should turn with 0.004- to 0.007-inch backlash.

(5) Remove all parts installed in steps (1) thru (3).

(6) If required, grind thrust washer (16) to obtain required amount of backlash. Grind 0.001 inch from the washer thickness to increase backlash by 0.001 inch.

i. Install gear assembly in cover as follows:

(1) Assemble spiroid gear (21) and spur pinion (20) to spur gear (19). Make sure the spiroid gear rides in machined groove in the spur gear shaft.

(2) Locate spur gear and pinion shaft ends in cover bearings (27 and 32). Push the gear assembly slowly into the cover. Take care not to damage packing (29).

(3) Install retaining ring (18).

j. Install bearing (17) and thrust washer (16) on the spiroid gear.

k. Locate free ends of the spur gear and pinion shafts in housing bearings (23 and 32). Push cover (15) and the gear assembly slowly into housing (10). Take care not to damage packing (25).

l. Install retaining ring (14). Install bolts (13), washers (12), and nuts (11). **TORQUE THE NUTS TO 30 POUND-INCHES.**

m. Install thrust washers (8), thrust bearings (9), and spiroid pinion (7) in housing. Pack the actuator housing with grease (C164).

n. Install thrust cap (6). Use screws (5). For actuating gear box 114S2623-3, lockwire screws together in pairs. Use lockwire (C206).

2-295. *Test Procedure—Lower Door Actuating Gear Box (AVIM).* (See fig. 2-77.)

a. Put the actuating gear box in a test fixture. Make sure spiroid pinion (7) is vertical. The test fixture must have 4,300 pound-inch clockwise restraint. It must also have 3,800 pound-inch counterclockwise restraint. Each restraint must oppose motion of the shaft.

b. Make three complete revolutions of the gear box output shaft in each direction. Use crank 114E4109-8. Check for operation. Operating torque shall be constant thru duty cycle. Actuating gear box shall operate smoothly with no binding or rough spots.

2-296. *Installation.* (See fig. 2-76.)

a. Position the actuating gear box (9) on the fuselage structure, on the aft side of the hatch opening. Slide the actuator gear shaft into the coupling (10).

b. Install the bolts (32), washers (31), and nuts (30) which secure the actuating gear box to the fuselage former. Install D-ring (33) with washer (35), and nut (34).

c. Slide the coupling (8) to the left to engage the actuator gear shaft. Secure the coupling to the gear shaft and to the drive shaft (6) with bolts (26 and 27), washers (25 and 29), and nuts (24 and 28).

d. Secure the coupling (10) to the actuator gear shaft and to the drive shaft (11) with bolts (22 and 23), washers (21), and nuts (20).

e. Secure the coupling (5) to the drive shaft (4) with bolts (19), washers (18), and nuts (17).

f. Install the rescue hatch lower door (14). (Refer to para 2-279.)

g. Install the access plate on the fuselage skin just aft of the rescue hatch lower door.

h. Close the floor rescue hatch door (1).

2-297. *Rescue Hatch Lower Door Coaming.*

(See fig. 2-78.) The rescue hatch coaming consists of members attached to beams on each side of cutout and to frame at forward and aft ends of cutout. These members are an aft and a side rail formed from aluminum alloy, retainers made from extruded sections of aluminum alloy, a stiffener formed from aluminum alloy, and coamings of plastic-impregnated glass cloth. Latch receptacles, contained in brackets, are attached to the coaming at four places.

2-298. *Inspection.* (See fig. 2-78.) Inspect damage to coamings for slight voids, small wrinkles, or holes which can be filled with a type A rivet. Damage to formed metal parts is limited to nicks, dents, and scratches which can be removed by burnishing, or to small holes which can be filled with a type A rivet. Damage must not destroy sealing quality nor interfere with door operation.

2-299. *Repair.* (See fig. 2-78.)

a. Refer to TM 55-1500-204-25/1 and TB 746-93-2 for damage classifications and repair of impregnated glass cloth parts. Damage to the formed metal parts not affecting a radius can be repaired by patching.

b. (AVIM). Extensive damage, such as the loss of more than 50 percent of the length of a member or numerous isolated damages, necessitates replacement of the member.

2-300. *Cabin Jettisonable Windows.*

(See fig. 2-79.) All window panes in the cabin fuselage structure assembly are made of stretched acrylic plastic. The panes are retained in the fuselage structure by an aluminum frame, a rubber seal, and a rubber-fabric seal filler. A nylon strap is looped over the seal filler for jettisoning purposes.

2-301. *Cleaning.* Refer to para 2-67.

2-302. *Inspection.* Refer to para 2-130.

2-303. *Removal.* Refer to para 2-131.

2-304. *Repair.* (See fig. 2-79.)

a. Damage to the aluminum frame is limited to nicks, dents, or scratches which can be removed by burnishing, or to small holes which can be filled with a type A rivet. Damage must not interfere with the removal, installation, or function of the window pane. Refer to TM 55-1500-204-25/1 for information on repair of window panes. Damage to the frame can be repaired.

b. (AVIM). Extensive damage, such as loss of more than 25 percent of the frame circumference or numerous isolated repairs, necessitates replacement of the damaged part.

2-305. *Replacement of Luminous Marker.* Refer to para 2-132.

2-306. *Installation.* Refer to para 2-133.

2-307. *Cabin Tunnel Drain Line System.*

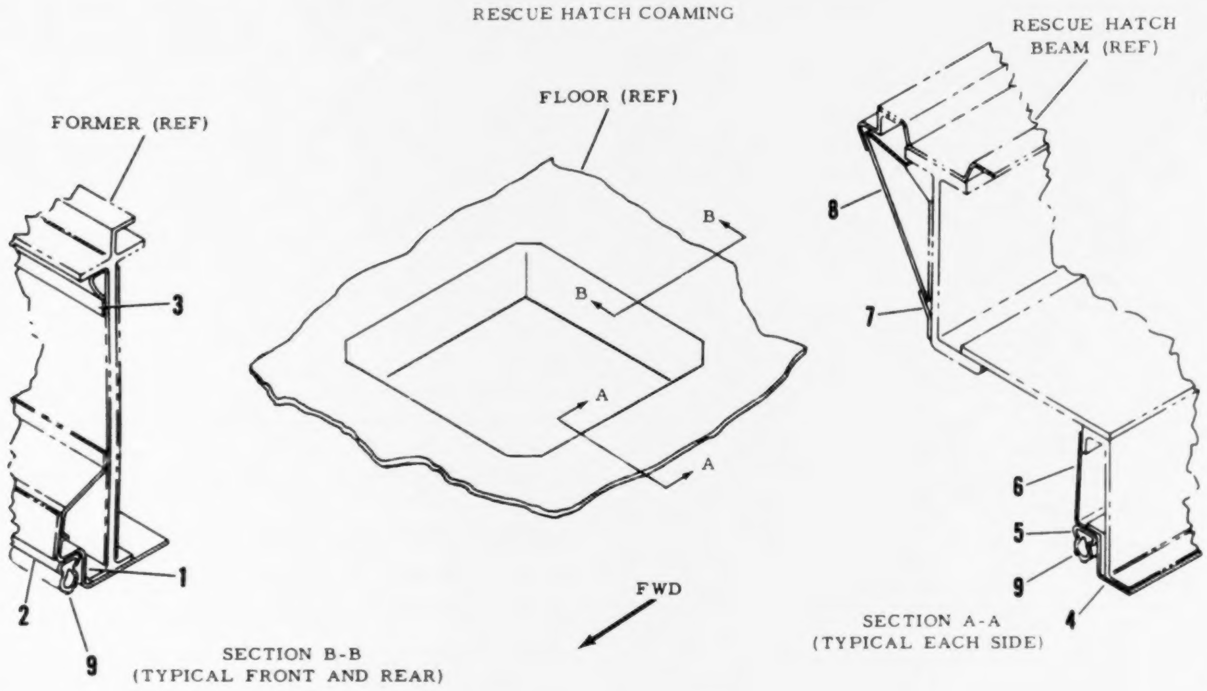
(See fig. 2-80.) The cabin tunnel drain line system is installed on the left side of the cabin crown at wl 50. Fluid in the tunnel area accumulates in a well under each synchronizing shaft coupling. The wells are interconnected by tubing. Fluid in the wells drain on the left side at sta 160 or to the aft transmission drip pan at sta 440. The drain system consists of welded tube assemblies and splice tubes (hose). Components of the system are accessible from within the cabin.

2-308. *Inspection of Drain Lines.* (See fig. 2-80.)

a. Inspect wells under shaft for cleanliness. Clean debris from wells.

b. Inspect tubes and hoses for damage, deterioration, or clogging.

c. Inspect drain outlets for damage and clogging.


RESCUE HATCH COAMING
RESCUE HATCH BEAM (REF)
FLOOR (REF)
FORMER (REF)
B
B
A
A
3
1
2
9
8
7
6
5
9
4
FWD
SECTION B-B (TYPICAL FRONT AND REAR)
SECTION A-A (TYPICAL EACH SIDE)

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	AFT RAIL	0.040 6061-T6 BARE	0.040 6061-T6 BARE
2	RETAINER	VS90415 6061-T6	NOTE B.
3	COAMING	NOTE C.	--
4	SIDE RAIL	0.040 6061-T6 BARE	0.040 6061-T6 BARE
5	RETAINER	VS90415 6061-T6	NOTE B.
6	COAMING	NOTE C.	--
7	STIFFENER	0.032 2024-T4 CLAD	0.032 2024-T3 CLAD
8	COAMING	NOTE C.	--
9	SEAL	--	NOTE D.

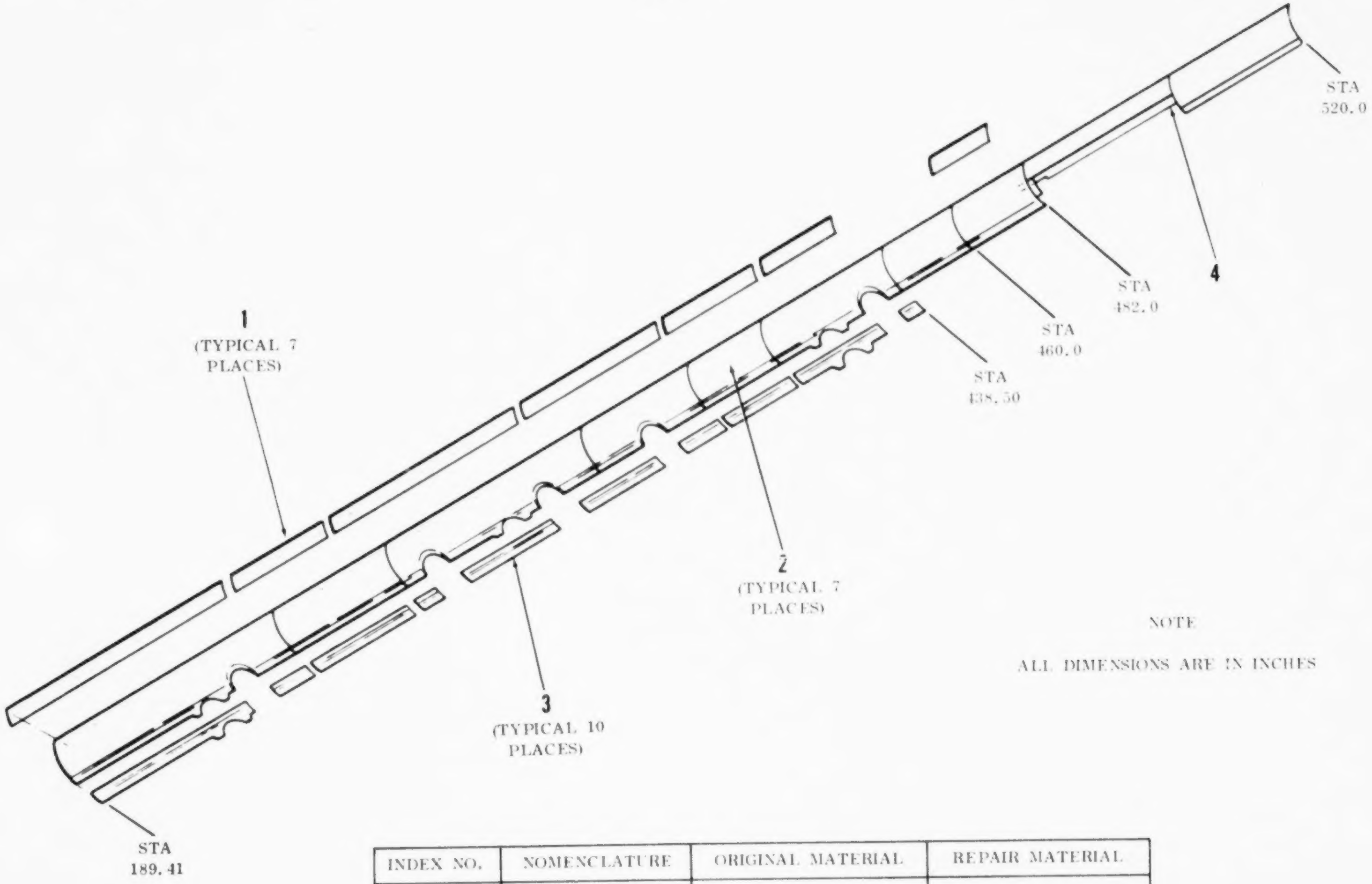
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH A SECTION CORRESPONDING TO THE ORIGINAL
C. THE COAMING IS MADE OF THREE PLIES OF PLASTIC - IMPREGNATED GLASS CLOTH
D. REPLACE WITH NEW SEAL 114SS658-5

42x51

B114-34-34SV

Figure 2-78. Fairing and Coaming Repairs—Cabin Fuselage Structure Assembly (Sheet 1 of 2)


STA
520.0
4
STA
482.0
STA
460.0
STA
438.50
1
(TYPICAL 7
PLACES)
2
(TYPICAL 7
PLACES)
3
(TYPICAL 10
PLACES)
STA
189.41

NOTE

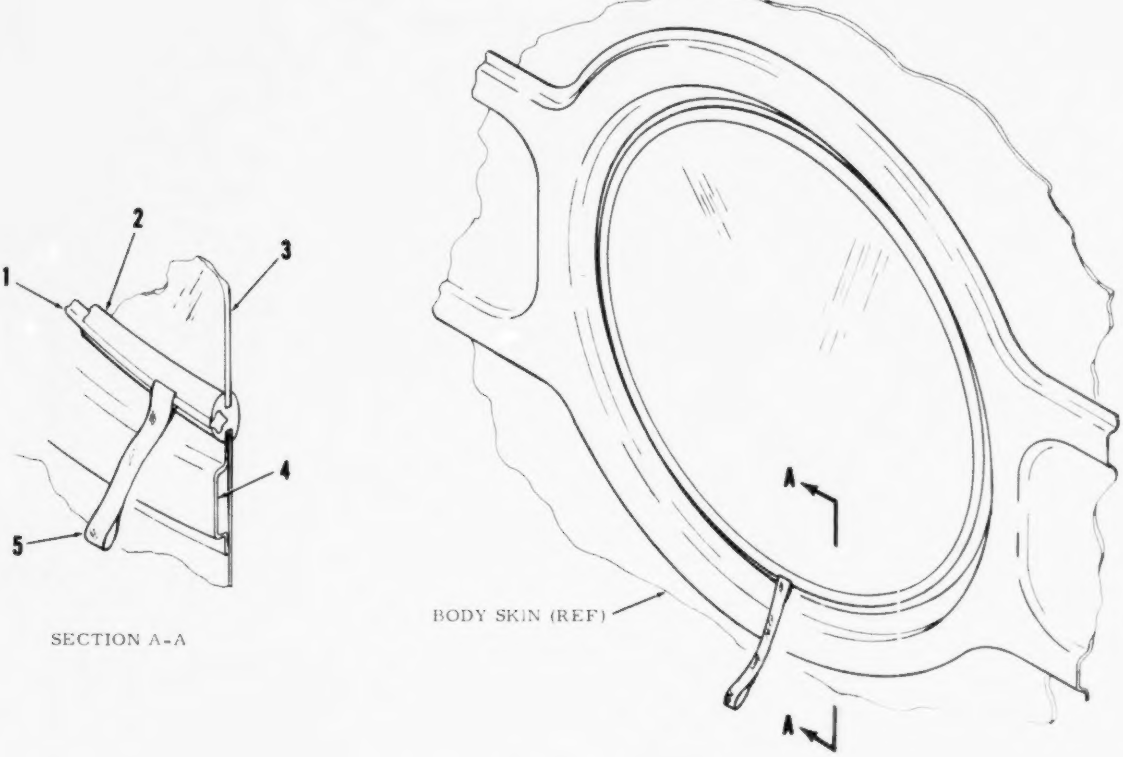
ALL DIMENSIONS ARE IN INCHES

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SEAL	RUBBER AMS3195	SAME AS ORIGINAL
2	FAIRING ASSY	NO. 181 FIBERGLASS MIL-P-8013, TYPE 1	--
3	RETAINER	NO. 181 FIBERGLASS MIL-P-8013, TYPE 1	--
4	FAIRING ASSY	0.020 2024-T4 CLAD	0.025 2024-T4 CLAD

B114-594-34SV

54 x 39

Figure 2-78. Fairing and Coaming Repairs—Cabin Fuselage Structure Assembly (Sheet 2 of 2)



SECTION A-A

INDEX	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SEAL FILLER	NOTE B.	--
2	SEAL	NOTE C.	--
3	PANE	NOTE D.	--
4	FRAME	0.040 2024-T4 CLAD	0.040 2024-T3 CLAD
5	STRAP	NOTE E.	--

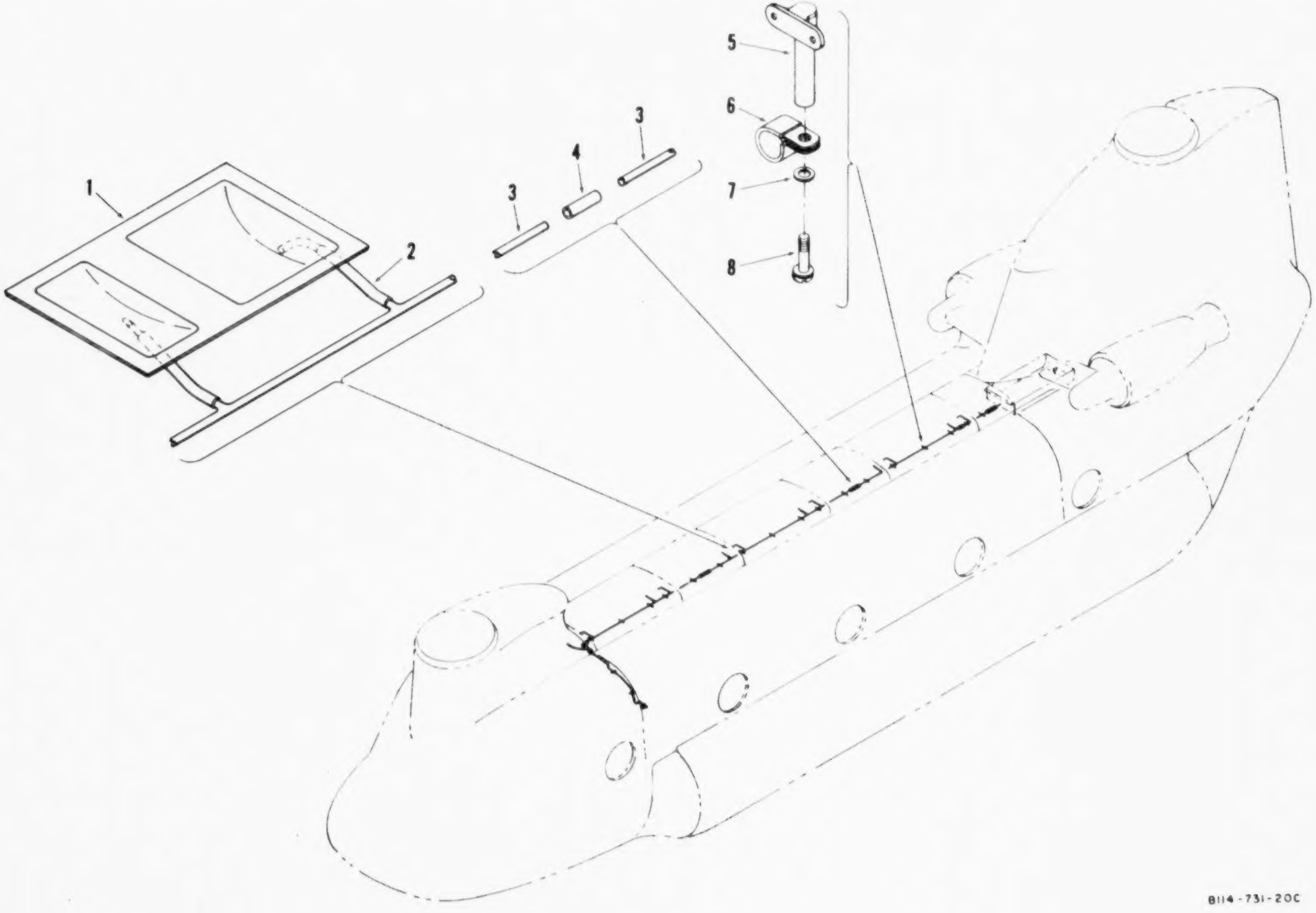
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW SEAL FILLER 114S2901-15
C. REPLACE WITH NEW SEAL 114S2901-16
D. THE WINDOW PANE IS MADE OF 0.080-THICK ACRYLIC SHEET MIL-P-25690
E. REPLACE WITH NEW STRAP 114S2901-12

42x51

B114-81-34SV

Figure 2-79. Window Pane and Framing Repairs—Cabin Fuselage Structure Assembly


1
2
3
4
3
5
6
7
8
B114-731-20C

1. Well
2. Splice tube (hose)
3. Tube assembly (rigid)
4. Splice tube (hose)
5. Spacer nut plate
6. Clamp
7. Washer
8. Screw

Figure 2-80. Cabin Tunnel Drain Line Installation

2-309. Component Replacement. (See fig. 2-80.) Replace components that are damaged, deteriorated, or clogged beyond cleaning as follows:

a. Remove acoustic insulation as required for access. (Refer to para 2-150 and 2-344.)

b. Replace a splice tube (2 or 4) as follows:

(1) Measure and record the length of the splice tube or tubes to be replaced.

CAUTION

Do not damage the rigid tubing.

(2) Cut the splice tube (2 or 4) from the rigid tubing.

(3) Clean the bonding adhesive from the tube assembly (3) or the well (1). Use methyl-ethyl-ketone (C216) and a clean cloth (C104).

(4) Cut a length of tubing equal to the length recorded in step (1). For replacement of splice tubes (2), use tubing (C368). For replacement of splice tubes (4), use jacket (C183).

(5) Apply a light coat of cement to the outside mating surface of the rigid tubing. Use cement (C90 or C88). Make sure the adhesive does not enter the rigid tubing.

(6) Slide the ends of the splice tube over the ends of the rigid tubing. The splice tube must overlap the rigid tubing by ½ to ⅝ inch.

NOTE

The clamps near the splice can be loosened or removed to aid in installation of the splice tubes.

c. Replace a tube assembly (3) as follows:

(1) Remove the splice tubes (2 and 4) connected to the tube assembly to be replaced. (Refer to step b.)

(2) Remove the screws (8), washers (7), and clamps (6) from the tube assembly to be replaced. Remove the defective tube assembly (3).

(3) Position the replacement tube assembly. Secure the tube assembly with the clamps (6), washers (7), and screws (8).

(4) Install splice tubes (2 and 4) as applicable. (Refer to step b.)

d. Reinstall the acoustic insulation. (Refer to para 2-152 and 2-346.)

2-310. Fuselage Drain Valve Assemblies.

(See fig. 2-81.) Fuselage drain valve assemblies are installed on the bottom skin of the helicopter. On code H.4 and 67-18432 thru 67-18452 that are not modified with drain plugs, manually operated drain valves are installed. Each drain valve consists of a seal, cover and screw. The drain valves are installed at 39 locations. When closed, the valve seals out water during water landings. When the valve is open, water (or other liquid) accumulation can drain from the bilge areas.

2-311. Inspection of Drain Valve. (See fig. 2-81.)

a. Inspect the seal (3) in the drain valve cover for damage and deterioration.

b. Inspect the drain valve hole for obstructions.

2-312. Replacement of Drain Valve. (See fig. 2-81.)

a. Open the drain valve (1) by partially turning out the screw (2). To replace the drain valve, turn out the screw completely.

b. Close the drain valve by turning in the screw (2) until the cover contacts the skin.

2-313. Fuselage Drain Plugs.

(See fig. 2-82.) On 67-18453 thru 67-18494, 68-15829 thru 68-15831, code I.2, J.1, and earlier modified helicopters, drain plugs are installed at 41 locations. On 68-15832 thru 68-15857, code J.3 and subq and earlier helicopters modified with MWO 55-1500-210-50/1 (ref only), twelve additional drain plugs are installed. Ten are at the ramp hinge and two are on the ramp skin. Each drain plug consists of a turnlock screw, retainer, seal, cam, spring clip, and plate. When closed, the valve seals out water during water landings. When the valve is open, water (or other liquid) accumulation can drain from the bilge areas.

NOTE

Drain plugs should be removed and stored in aircraft unless water landings are planned.

2-314. Inspection of Drain Plug. (See fig. 2-82.)

a. Inspect the drain plug assembly seal (4) for deterioration.

b. Inspect the cam (5) for wear and general condition.

c. Inspect the spring clip (6) for a positive locked position as shown in fig. 2-82.

2-315. Replacement of Drain Plug. (See fig. 2-82

a. Open the drain plug (1) by turning the turnlock screw (2) and allowing the drain plug assembly to drop from the hole. The wire retainer (3) will suspend the drain plug from the fuselage.

b. Install the drain plug assembly (1) by positioning it up into the hole in the fuselage until the plate (7) is flush with the fuselage. Fasten the turnlock screw. Do not overtighten the turnlock screw. Check that the drain plug is secure.

2-316. Strakes.

(See fig. 2-83.) A typical strake consists of four formed sections of aluminum alloy and two fiberglass sections. The strakes are attached to the underside of the pods with screws, and extend from sta 376.9 to sta 482, each side. Strakes are also installed at the bottom outboard areas of the cargo ramp, from ramp sta 37.5 to the trailing edge.

2-317. Inspection. Inspect the strake installations for damage or deterioration.

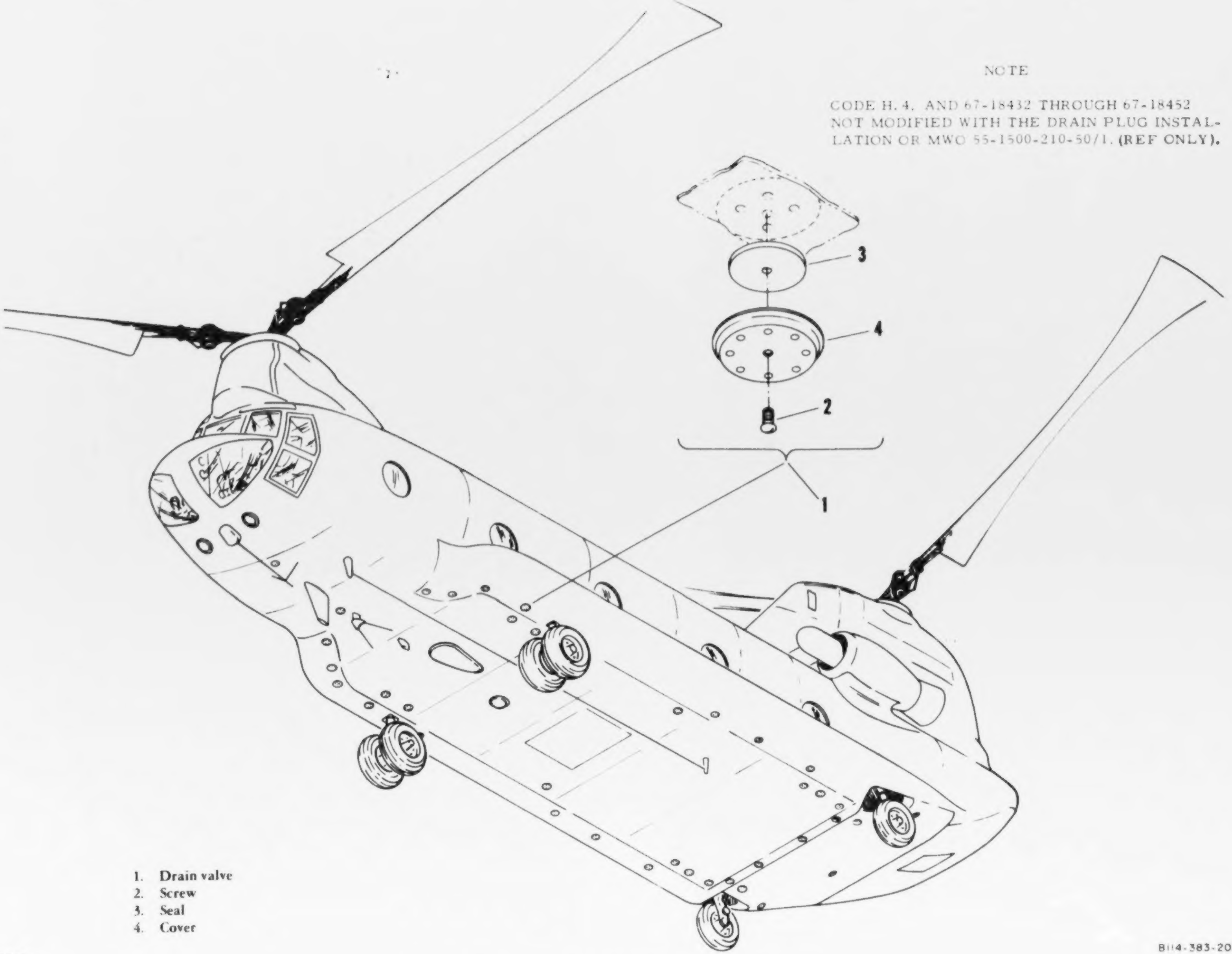
2-318. Repair. (See fig. 2-83.)

a. In aluminum alloy sections, nicks and scratches, and small cracks which can be corrected by stop-drilling, are permitted. Damage to fiberglass sections is limited to small cracks which can be corrected by stop-drilling.

b. (AVIM). Damage exceeding the limits for negligible damage should be repaired by insertion. Numerous isolated damages or damage that is impracticable to repair, necessitates replacement in whole or in part.

2-319. Buffer Boards.

(See fig. 2-84.) One buffer board assembly (4) is installed in each side of the cabin between sta 160 and 440. The buffer boards completely cover the cabin heater louvers (6) to prevent damage during cargo loading and unloading.



NOTE

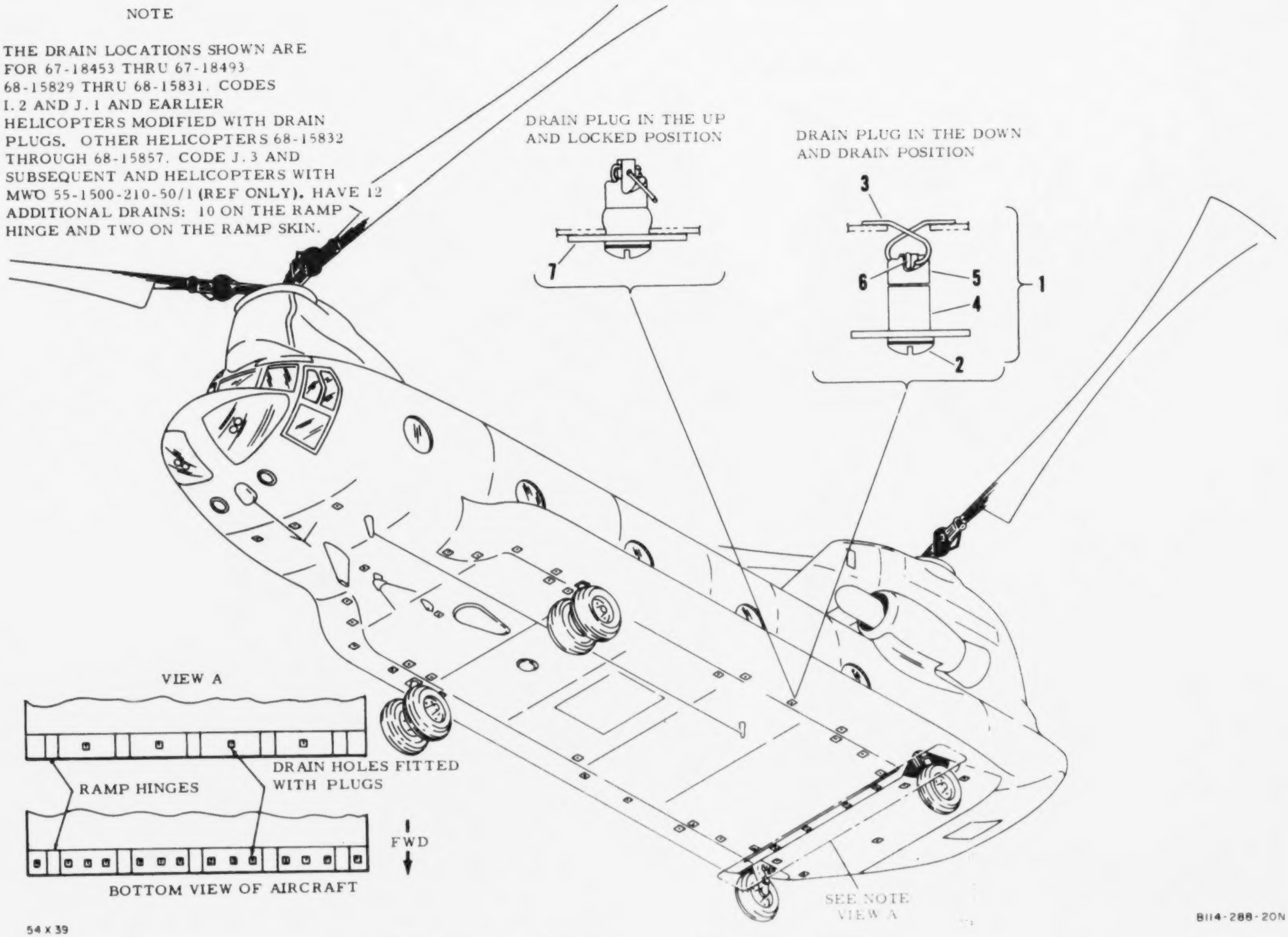
CODE H. 4. AND 67-18432 THROUGH 67-18452 NOT MODIFIED WITH THE DRAIN PLUG INSTALLATION OR MWO 55-1500-210-50/1. (REF ONLY).

1. Drain valve
2. Screw
3. Seal
4. Cover

Figure 2-81. Drain Valve Installation and Locations

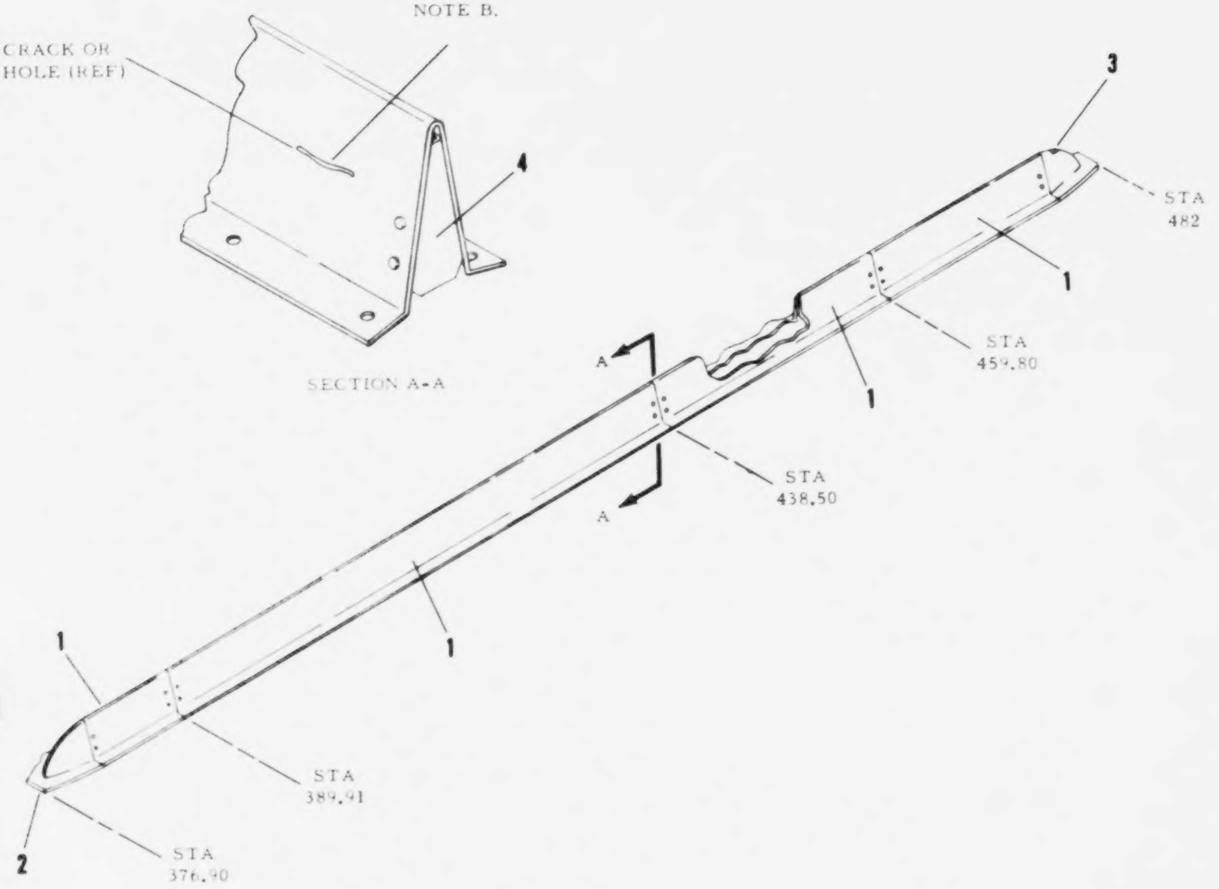
NOTE

THE DRAIN LOCATIONS SHOWN ARE FOR 67-18453 THRU 67-18493 68-15829 THRU 68-15831. CODES I. 2 AND J. 1 AND EARLIER HELICOPTERS MODIFIED WITH DRAIN PLUGS. OTHER HELICOPTERS 68-15832 THROUGH 68-15857. CODE J. 3 AND SUBSEQUENT AND HELICOPTERS WITH MWO 55-1500-210-50/1 (REF ONLY). HAVE 12 ADDITIONAL DRAINS: 10 ON THE RAMP HINGE AND TWO ON THE RAMP SKIN.


DRAIN PLUG IN THE UP AND LOCKED POSITION
7
DRAIN PLUG IN THE DOWN AND DRAIN POSITION
3
6
5
4
1
2
VIEW A
DRAIN HOLES FITTED WITH PLUGS
RAMP HINGES
FWD
BOTTOM VIEW OF AIRCRAFT
SEE NOTE VIEW A
B114-288-20N
54 X 39

1. Drain plug
2. Turnlock screw
3. Retainer
4. Seal
5. Cam
6. Spring clip
7. Plate

Figure 2-82. Drain Plug Installation and Locations


NOTE B.
CRACK OR HOLE (REF)
4
SECTION A-A
3
STA 482
1
STA 459.80
1
A
A
STA 438.50
1
1
STA 389.91
2
STA 376.90

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	STRAKE	0.050 2024-T4 CLAD	0.050 2024-T3 CLAD
2	STRAKE NOSE PIECE	6-PLY NO. 181-75 GLASS CLOTH	NOTE C.
3	STRAKE TAIL PIECE	6-PLY NO. 181-75 GLASS CLOTH	NOTE C.
4	CAP	0.025 2024-T4 CLAD	0.025 2024-T3 CLAD

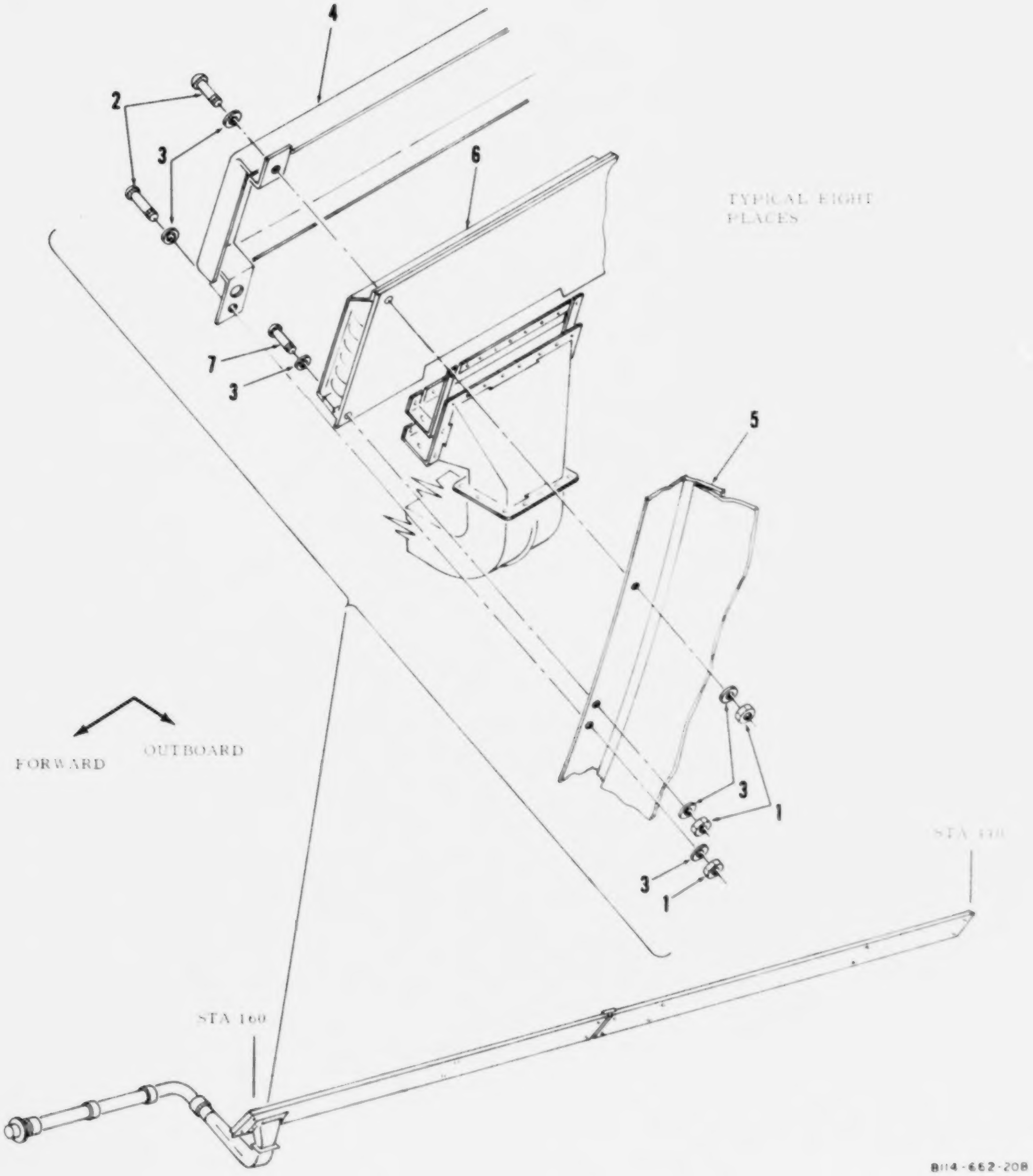
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. EXTERNAL PATCHES NOT PERMITTED. USE INSERTION TYPE PATCHES ONLY
C. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR CLASSIFICATION OF DAMAGE AND REPAIR OF IMPREGNATED GLASS CLOTH PARTS

42x51

B114 274-34SV

Figure 2-83. Strake Repairs, Pod Installation—Cabin Fuselage Structure Assembly


4
2
3
6
TYPICAL EIGHT PLACES
7
3
5
FORWARD
OUTBOARD
3
1
STA 190
3
1
STA 160
B114-662-208

1. Nut
2. Screw
3. Washer
4. Buffer board assembly
5. Former
6. Heater louver
7. Screw

Figure 2-84. Buffer Board Installation

a. Each assembly consists of four lengths of aluminum alloy buffer board riveted to eight mounting brackets. The assemblies are secured to formers by nuts (1), screws (2), and washers (3).

b. The buffer board assemblies are accessible when the troop seats are in the folded stowage position.

2-320. Inspection. Inspect the buffer boards for cracks, holes, dents.

2-321. Removal. (See fig. 2-84.) Remove either assembly as follows:

a. Stow the troop seats in the folded position. (Refer to para 2-349.)

b. Remove the nuts (1), screws (2), and washers (3) securing the buffer board assembly (4) to the formers (5).

c. Remove the buffer board from around the heater louver (6).

2-322. Repair. Nicks and scratches on buffer boards are permissible. Holes can be repaired by patching. Extensive damage, not reparable by patching or insertion, necessitates replacement of the damaged buffer board.

2-323. Installation. (See fig. 2-84.) Install either assembly as follows:

a. Position the buffer board around the heater louver (6). Make sure that the heads of the screws (7) are housed in the clearance holes in the mounting brackets.

b. Install the screws (2), washers (3), and nuts (1).

c. Unstow and secure the troop seats. (Refer to para 2-350.)

2-324. Equipment Support Structures.

a. (See fig. 2-85.) The support structures for equipment located in the cabin fuselage structure assembly include drive shaft support, the cargo hook support, fuel relay box support, and the intercostals serving as the litter strap supports and the cabin dome light brackets. There are six drive shaft supports located on the cabin crown panel at the following sta: 160.12 thru 180.12; 200.12 thru 220.12; 260.12 thru 280.12; 300.12 thru 320.12; 360.12 thru 380.12; and 400.12 thru 420.12. The cargo hook support is located between sta 400 and 440 on the bottom panel at bl 0, and is basically a sandwich honeycomb section with reinforcing members. The litter strap support intercostals are flanged webs located between sta 160 and 180.01; 240 and 260 and 280, 340 and 360; and 360 and 380 on each side of the cabin fuselage crown panel. The cabin dome light brackets are located at sta 175.50, 248.50, 345.75, and 432.50.

b. The only support structure required for equipment in the aft fuselage structure assembly is the ramp actuator support located between sta 482 and 502.43, at wl +5.8, on each side of the fuselage. Each support consists of a web made of 2024-T4 clad aluminum alloy containing flanged lightening holes. A cap of extruded 7075-T6 aluminum alloy, Alcoa 78J, is riveted between sta 482 and 502.43. The cap provides support for the web.

2-325. Inspection. Inspect all equipment support structures for holes, cracks, elongated holes, or damage to formed parts or extrusions.

CAUTION

Damage to drive shaft supports can affect drive shaft alignment. Misalignment of drive shafts must not exceed 15 minutes (¼°). Any damage affecting size or location of mounting holes requires special tools (T150) and 114G1168-2.

2-326. Repair. (AVIM) See fig. 2-3 for examples of damage to internal webs and formed parts. Refer to Tm 55-1500-204-25/1 for damage information on the sandwich honeycomb sections of the cargo hook support. (See fig. 2-85.) Damage to internal webs affecting less than one-half the cross secion can be repaired by patching. Damage to formed and extruded parts not affecting the radius or heel can be repaired by patching. Damage affecting more than one-half the cross section of an internal web should be repaired by insertion. Damage affecting the heel or radius of an extruded or formed part should be repaired by insertion. Damage on the flange of the tunnel cover support bracket resulting from chafing against the flex coupling of the No. 6 synchronizing shaft can be repaired by trimming the flange of the bracket and installing an angle. See fig. 2-86. Damage to the cabin dome light brackets can be repaired by standard methods. In addition, a bracket and clip should be added. See fig. 2-85.

2-327. Structural Hinges.

(See fig. 2-68.) The hinges are made from extruded sections of aluminum alloy. The hinges are attached longitudinally to the bottom of the fuselage, each side, at wl-42, between sta 180 and 240, and 260 and 440. Hinge continuity is broken between sta 240 and 260 where the forward landing gear support is located.

2-328. Inspection. Inspect all hinges for nicks, scratches, damaged lugs.

2-329. Repair. Damage to the hinge is limited to nicks and scratches which can be removed by burnishing. The depth of burnished area must not exceed 10 percent of the thickness of hinge and must clear all rivets and radii a minimum of ¾ inch. The criteria for number of damaged lugs which can be removed before repair of hinge is required are as follows:

CAUTION

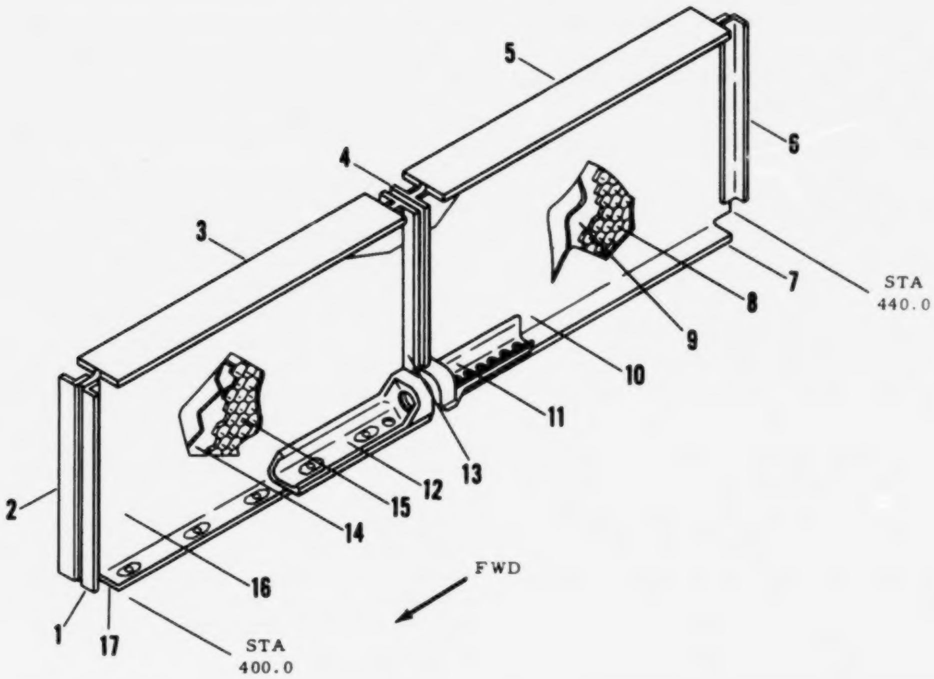
When classifying damage to either the fuselage or pod hinge, the opposing number must be considered to ensure effectiveness of the hinge as a unit.

a. Between sta 180 and 374, a maximum of three successive lugs can be removed if a minimum of four undamaged lugs remain on each side of damaged lugs.

b. Between sta 375.4 and 400.9, a maximum of four successive lugs can be removed if a minimum of seven undamaged lugs remain on each side of damaged lugs.

c. Between sta 400.9 and 441.5, a maximum of three successive lugs can be removed if lugs adjacent to pod formers at sta 400.9, 413.55, 425.7, 438.5, and 441 remain undamaged. The removal of lugs entails rounding off

CARGO HOOK SUPPORT



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SUPPORT	ALCOA 22878 7075-T6	0.071 4130
2	SUPPORT	ALCOA 22878 7075-T6	0.071 4130
3	CAP	VS90302 7075-T6	NOTE B.
4	CAP	VS90302 7075-T6	NOTE B.
5	CAP	VS90302 7075-T6	NOTE B.
6	ANGLE	ALCOA 62564 7075-T6	0.080 4130
7	CAP	VS90302 7075-T6	NOTE B.
8	CORE	0.255, 3.0-3/8-20N-3003	NOTE B.
9	SKIN	0.020 7075-T6 BARE	NOTE B.
10	SKIN	0.020 7075-T6 BARE	NOTE B.
11	ATTACHMENT	7075-T6 FORGING	NOTE D.
12	ATTACHMENT	7075-T6 FORGING	NOTE C.
13	CAP	VS90302 7075-T6	NOTE B.
14	SKIN	0.032 7075-T6 BARE	NOTE B.
15	CORE	0.255, 3.0-3/8-20N-3003	NOTE B.
16	SKIN	0.032 7075-T6 BARE	NOTE B.
17	CAP	VS90316 7075-T6	NOTE B.

NOTES

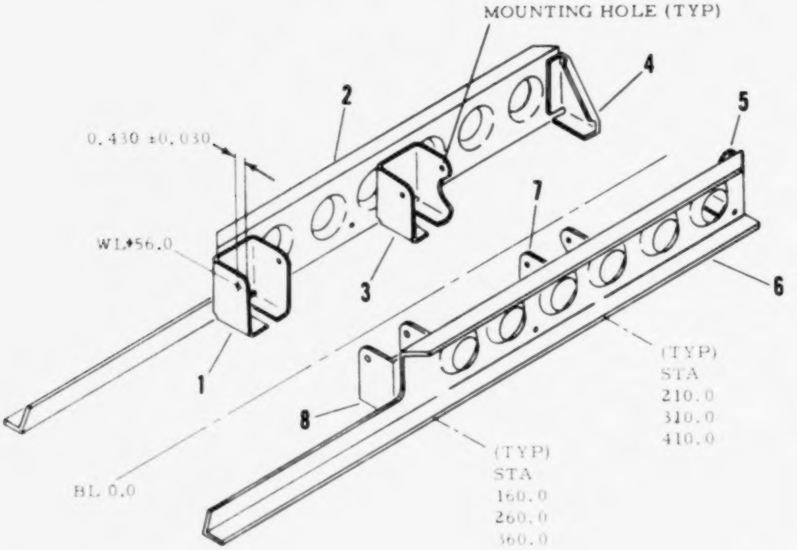
A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO TM 55-1500-204-25/1 FOR REPAIRS TO SANDWICH HONEYCOMB STRUCTURE.
C. REPLACE WITH NEW ATTACHMENT 114S2854-3
D. REPLACE WITH NEW ATTACHMENT 114S2854-5

42x51

B114-107-34SV

Figure 2-85. Equipment Support Structure Repairs—Cabin Fuselage Structure Assembly (Sheet 1 of 4)

DRIVE SHAFT SUPPORTS--STATIONS 160.0, 210.0, 260.0, 310.0, 360.0 AND 410.0



STATIONS 160.0, 260.0, AND 360.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BRACKET	0.080 2024-T4 CLAD	NOTE B.
2	SUPPORT	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
4	BRACKET	0.032 2024-T4 CLAD	NOTE C.
5	BRACKET	0.032 2024-T4 CLAD	NOTE C.
6	SUPPORT	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
8	BRACKET	0.080 2024-T4 CLAD	NOTE B.

STATIONS 210.0, 310.0, AND 410.0

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
2	SUPPORT	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
3	BRACKET	0.080 2024-T4 CLAD	NOTE D.
4	BRACKET (2 REQD)	0.032 2024-T4 CLAD	NOTE C.
5	BRACKET (2 REQD)	0.032 2024-T4 CLAD	NOTE C.
6	SUPPORT	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
7	BRACKET	0.080 2024-T4 CLAD	NOTE D.

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPLACE WITH NEW BRACKET 114S2352-38 RH AND -37 LH FOR STATION 160.0 ONLY; 114S2352-40 RH AND FOR STATION 160.0 ONLY; 114S2352-40 RH AND -39 LH FOR STATION 260.0 ONLY, AND 114S2352-42 RH AND -41 LH FOR STATION 360.0

C. REPLACE WITH NEW BRACKET 114S2745-1

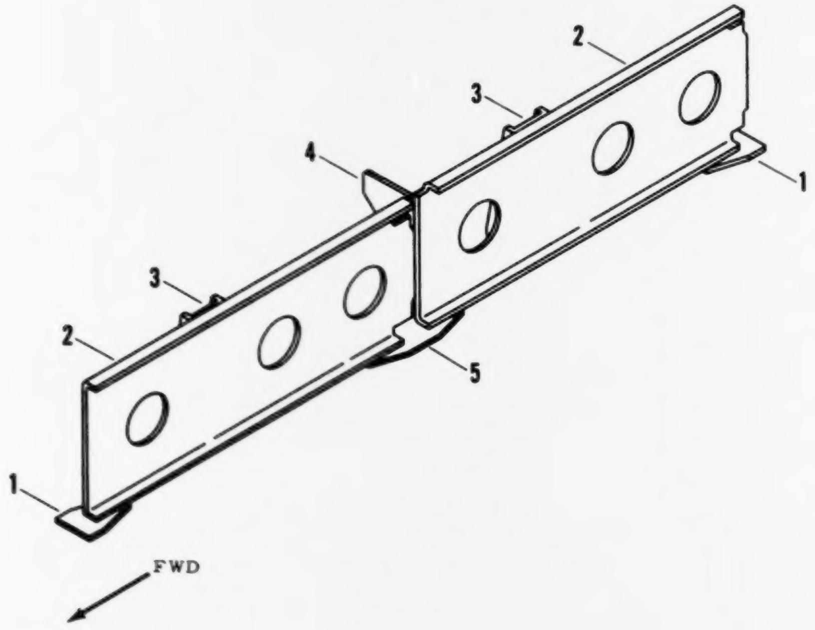
D. REPLACE WITH NEW BRACKET 114S2352-36 RH AND -35 LH

42x51

B114 108 34SV

Figure 2-85. Equipment Support Structure Repairs—Cabin Fuselage Structure Assembly (Sheet 2 of 4)

LITTER STRAP SUPPORT--STATIONS 160.0 TO 180.0, 240.0 TO 260.0, 260.0 TO 280.0, 340.0 TO 360.0, AND 360.0 TO 380.0



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	GUSSET	0.032 2024-T4 CLAD	NOTE C.
2	WEB	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD
3	BRACKET	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD
4	ANGLE	0 032 7075-T6 CLAD	NOTE E.
5	GUSSET	0.032 2024-T4 CLAD	NOTE D.

NOTES

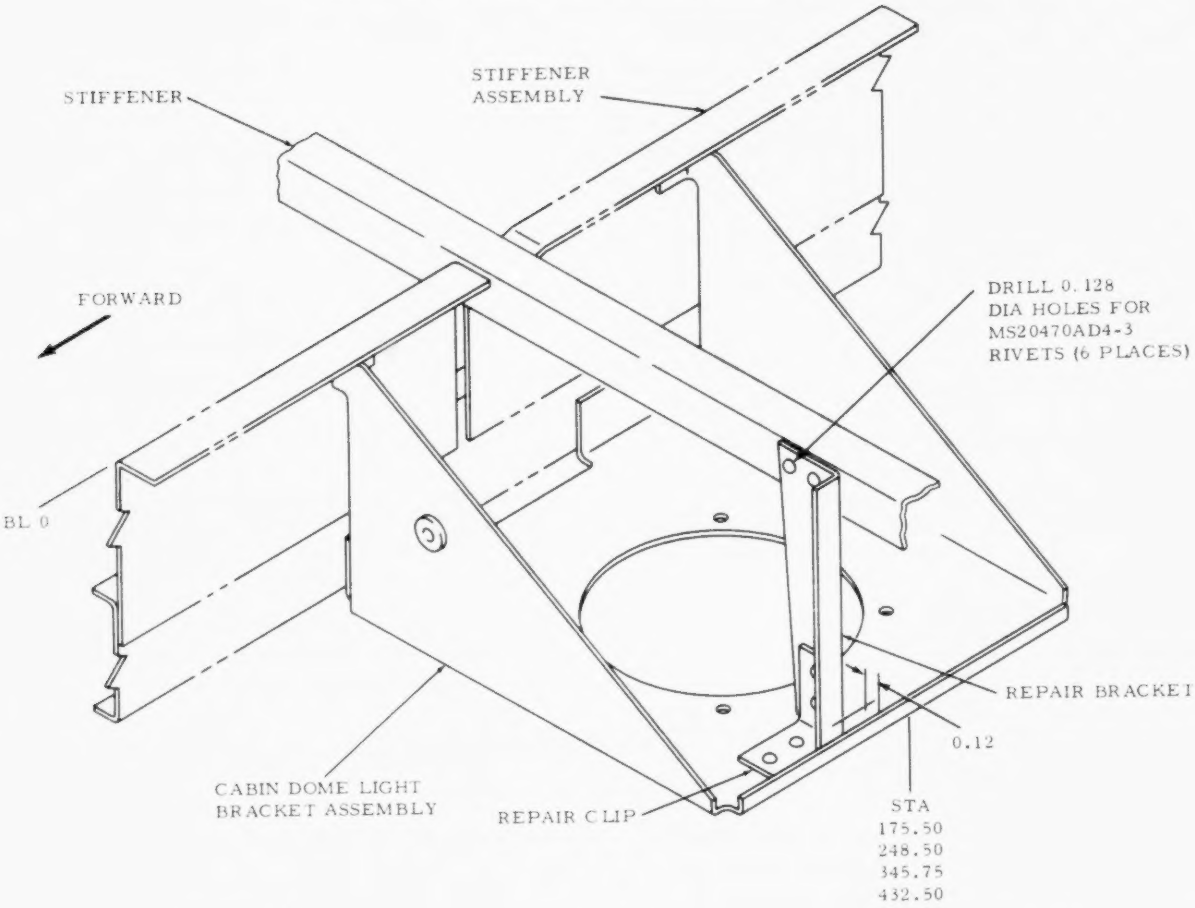
A. ALL DIMENSIONS ARE IN INCHES
B. THE RH BEAM IS SHOWN. THE LH BEAM IS SIMILAR IN CONSTRUCTION. REPAIR DATA LISTED IS APPLICABLE TO BOTH CONFIGURATIONS
C. REPLACE WITH NEW GUSSET 114S2351-23 RH AND LH
D. REPLACE WITH NEW GUSSET, 114S2351-21 RH AND LH
E. REPLACE WITH NEW ANGLE, 114S2351-31 RH AND -29 LH

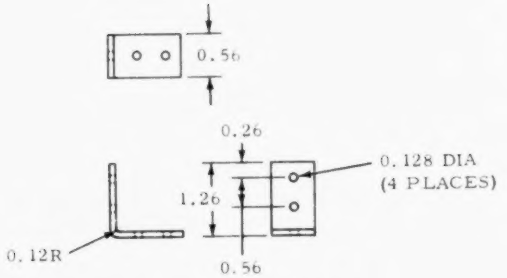
42x51

B114-109-34SV

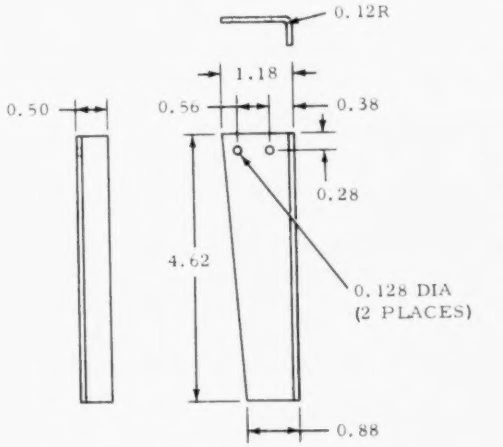
Figure 2-85. Equipment Support Structure Repairs—Cabin Fuselage Structure Assembly (Sheet 3 of 4)

REPAIR OF THE CABIN DOME LIGHT BRACKETS


STIFFENER
STIFFENER ASSEMBLY
FORWARD
DRILL 0.128 DIA HOLES FOR MS20470AD4-3 RIVETS (6 PLACES)
BL 0
REPAIR BRACKET
0.12
CABIN DOME LIGHT BRACKET ASSEMBLY
REPAIR CLIP
STA 175.50 248.50 345.75 432.50


0.56
0.26
0.128 DIA (4 PLACES)
1.26
0.12R
0.56

REPAIR CLIP. MAKE FROM 0.032 2024-T3 CLAD


0.12R
1.18
0.50
0.56
0.38
0.28
4.62
0.128 DIA (2 PLACES)
0.88

NOTES

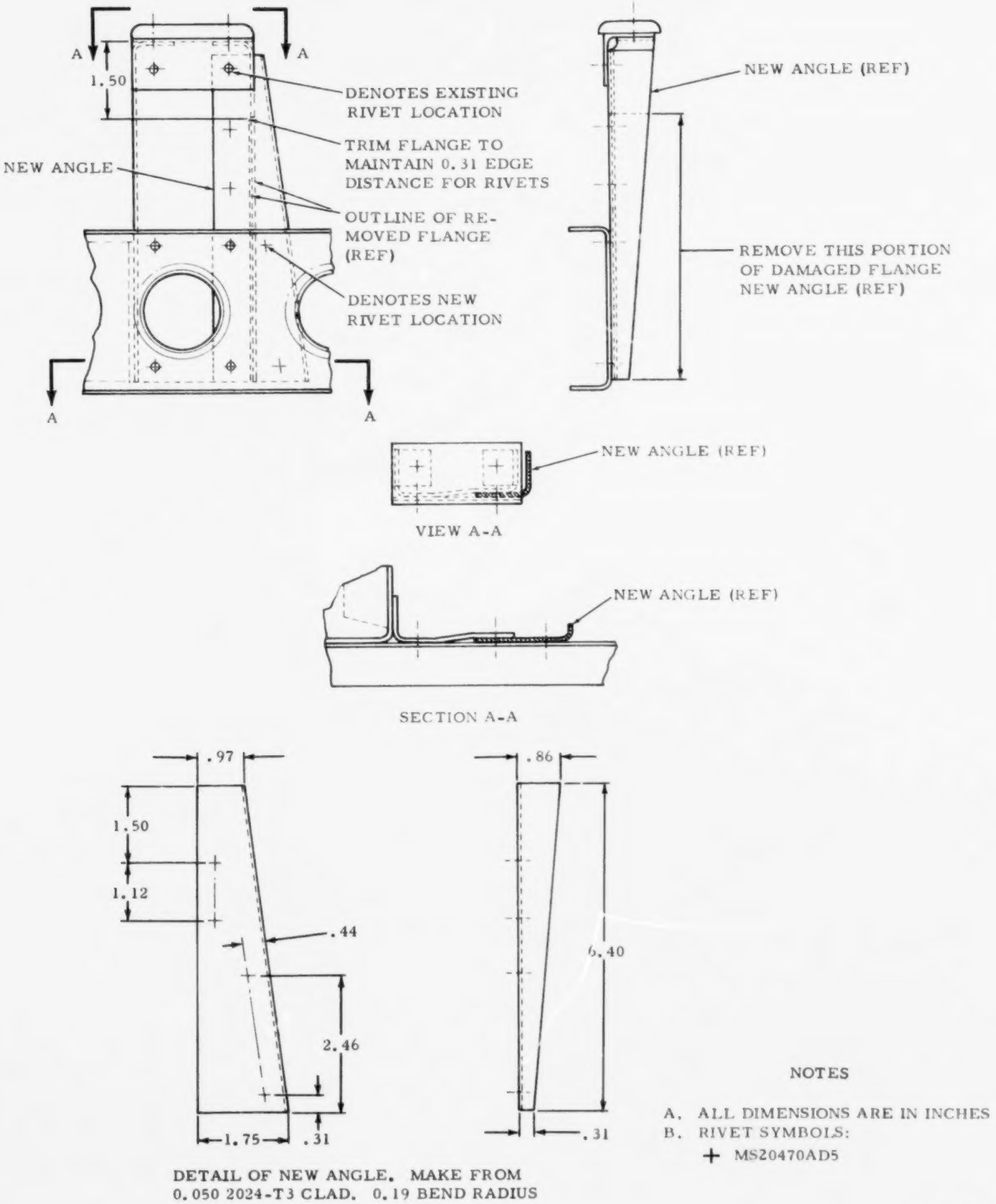
A. ALL DIMENSIONS ARE INCHES
B. IT MAY BE NECESSARY TO RELOCATE A DRAIN TUBE STANDOFF ADJACENT TO THE REPAIR BRACKET

REPAIR BRACKET. MAKE FROM 0.032 2024-T3 CLAD

42x51

B114 391 34S

Figure 2-85. Equipment Support Structure Repairs—Cabin Fuselage Structure Assembly (Sheet 4 of 4)


A
A
1.50
DENOTES EXISTING RIVET LOCATION
TRIM FLANGE TO MAINTAIN 0.31 EDGE DISTANCE FOR RIVETS
NEW ANGLE
OUTLINE OF RE-MOVED FLANGE (REF)
DENOTES NEW RIVET LOCATION
A
A
NEW ANGLE (REF)
REMOVE THIS PORTION OF DAMAGED FLANGE NEW ANGLE (REF)
NEW ANGLE (REF)
VIEW A-A
NEW ANGLE (REF)
SECTION A-A
.97
1.50
1.12
.44
2.46
1.75
.31
.86
6.40
.31

DETAIL OF NEW ANGLE. MAKE FROM 0.050 2024-T3 CLAD. 0.19 BEND RADIUS

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. RIVET SYMBOLS:

+ MS20470AD5

42x51

B114-329-34S

Figure 2-86. Tunnel Cover Support Bracket Repair—Cabin Fuselage Structure Assembly

broken edges and the application of primer (C259) to reworked areas. Damage more extensive than negligible can be repaired. See fig. 2-68.

d. (AVIM). Damage more extensive than negligible which cannot be repaired by insertion necessitates replacement.

2-330. Floor Beams.

Refer to para 2-44.

2-331. Inspection. Refer to para 2-45.

2-332. Repair. Refer to para 2-46 and 2-47.

2-333. Replacement. Refer to para 2-48.

2-334. Cabin Floors.

(See fig. 2-87.) The cabin fuselage structure assembly flooring, extending from sta 120 to 482, consists of 12 floor panels, 5 tiedown beams, and a rescue hatch door. All panel assemblies are similar in their basic construction. A typical panel is made up of three extruded sections of magnesium alloy riveted together. Raised areas of the extruded section serve as cargo skid rails. The rescue hatch door is a sandwich honeycomb structure. The skins are made of rigidized aluminum alloy. The edge members are extruded sections of aluminum alloy. A half hinge is attached to the forward end of the hatch. Cargo skid rails, riveted longitudinally to the top skin of the door, are extruded sections of magnesium alloy. The center portion of the cabin flooring is coated with walkway material to provide a nonskid area.

2-335. Inspection of Cabin Floor. (See fig. 2-87.) Inspect for the following conditions:

a. Security of hardware, cracks, corrosion.

b. Tiedown adapters and beams for missing or loose hardware.

c. Missing, loose, or broken isolators.

d. Nicks, dents, and scratches which can be removed by burnishing, and holes, up to ¼-inch diameter, which can be plugged with a type B rivet, are negligible.

2-336. Removal. (See fig. 2-87.)

NOTE

Bolts AN3 and AN4 with washers AN960 are used for securing floor panels.

a. Remove the four forward panels (13, 14, and 15) as follows:

(1) Forward outboard panel (13 or 15) removal.

(a) Remove all bolts and washers from splice plate (16) at aft end of panel. Remove splice plate from panel.

(b) Remove isolator mounting screws at aft end of the panel. They are the recessed screws which were covered by the splice plate.

(c) Remove bolts and washers from both sides and forward end of panel.

(d) Remove bolts and washers (23) holding seal (25) and seal retainer (24) to panel.

(e) Lift inboard side of the panel up. Slide the panel inboard to free the upstops from the outboard tiedown beam (26). Remove the panel.

(2) Forward inboard panel (14) removal.

(a) Remove all bolts and washers from splice plate (16) at aft end of panel. Remove splice plate from panel.

(b) Remove isolator mounting screws at the aft end of the panel. They are the recessed screws which were covered by the splice plate.

(c) Remove bolts and washers from forward end and both sides of panel. Remove the panel.

b. Remove the four center panels (7, 8, and 17) as follows:

(1) Center outboard panel (8 or 17) removal.

(a) Remove all bolts and washers from splice plates (16) at each end of panel. Remove the screws that attach the isolators to each end of the panel.

(b) Remove bolts and washers from inboard side of panel.

(c) Remove bolts and washers holding seal (25) and seal retainer (24) to panel.

(d) Lift inboard side of the panel. Slide the panel inboard to free the upstops (22) from the outboard tiedown beam (26). Remove the panel.

(2) Center inboard panel (7) removal.

(a) Remove all bolts and washers from splice plate at forward end of panel. Remove the screws that attach the isolators to the forward end of the panel.

(b) Remove bolts and washers from both sides and aft end of panel.

(c) Lift forward end of the panel up. Slide the panel forward to free it from the rescue hatch frame. Remove the panel.

c. Remove the four aft panels (3, 4, and 5) as follows:

(1) Aft outboard panel (3 or 5) removal.

(a) Remove all bolts and washers from the splice plate at forward end of panel. Remove splice plate (6) from panel.

(b) Remove isolator mounting screws at the forward end of the panel. They are the recessed screws which were covered by the splice plate.

(c) Remove bolts and washers from both sides and aft end of panel.

(d) Remove bolts and washers (23) holding seal (25) and seal retainer (24) to panel.

(e) Move inboard side of the panel up, slide the panel inboard to free upstops (22) from the outboard tiedown beam (26). Remove the panel.

(2) Aft inboard panel (4) removal.

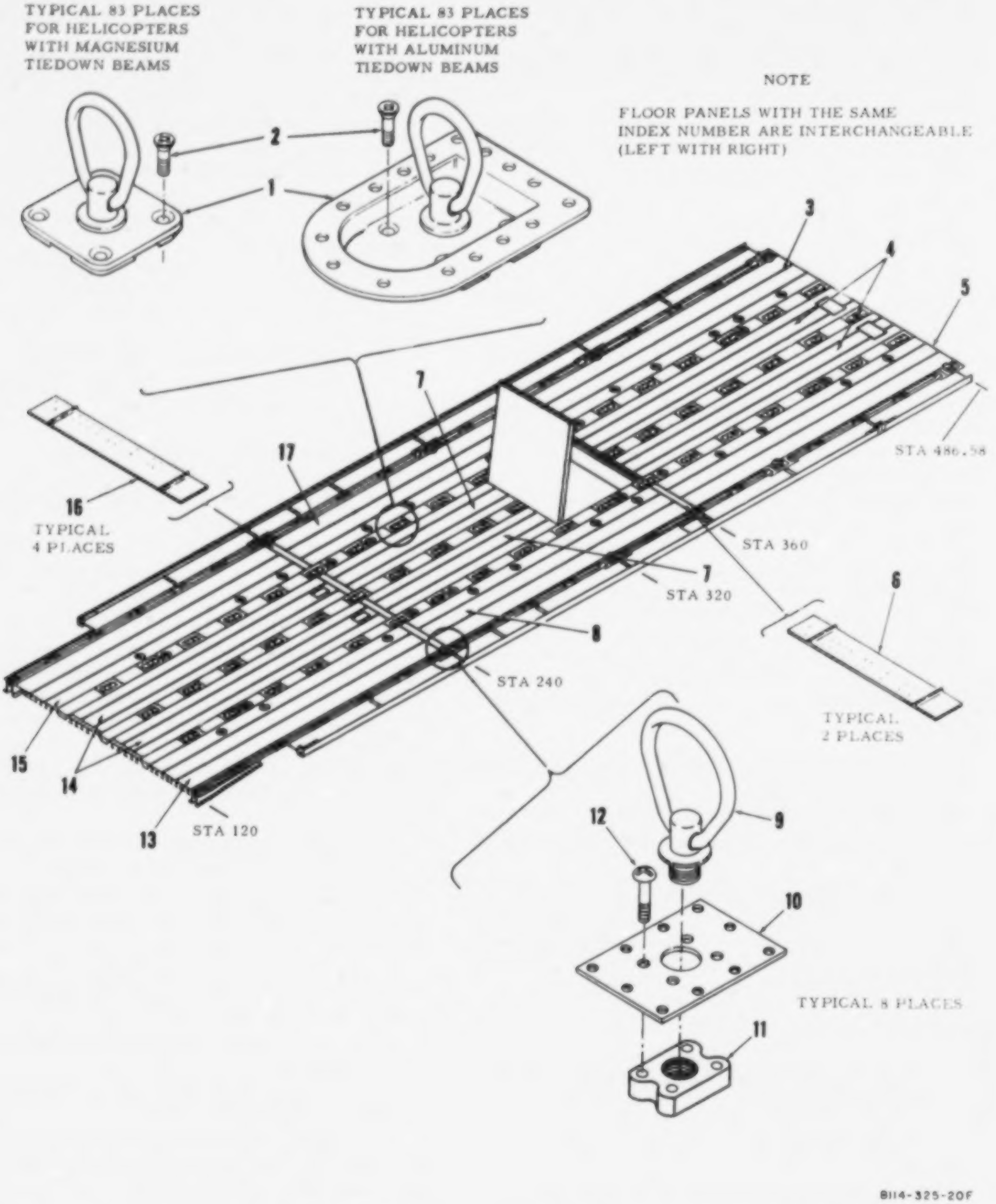
(a) Remove bolts and washers from each end and both sides of panel.

(b) Lift aft end of the panel up. Slide the panel aft to free it from rescue hatch frame.

d. Remove the floor rescue hatch door as follows:

(1) If the door is closed, release the latch of the door and open the door fully so that it rests on the floor.

(2) Remove the uppermost hinge pin. Remove the door.

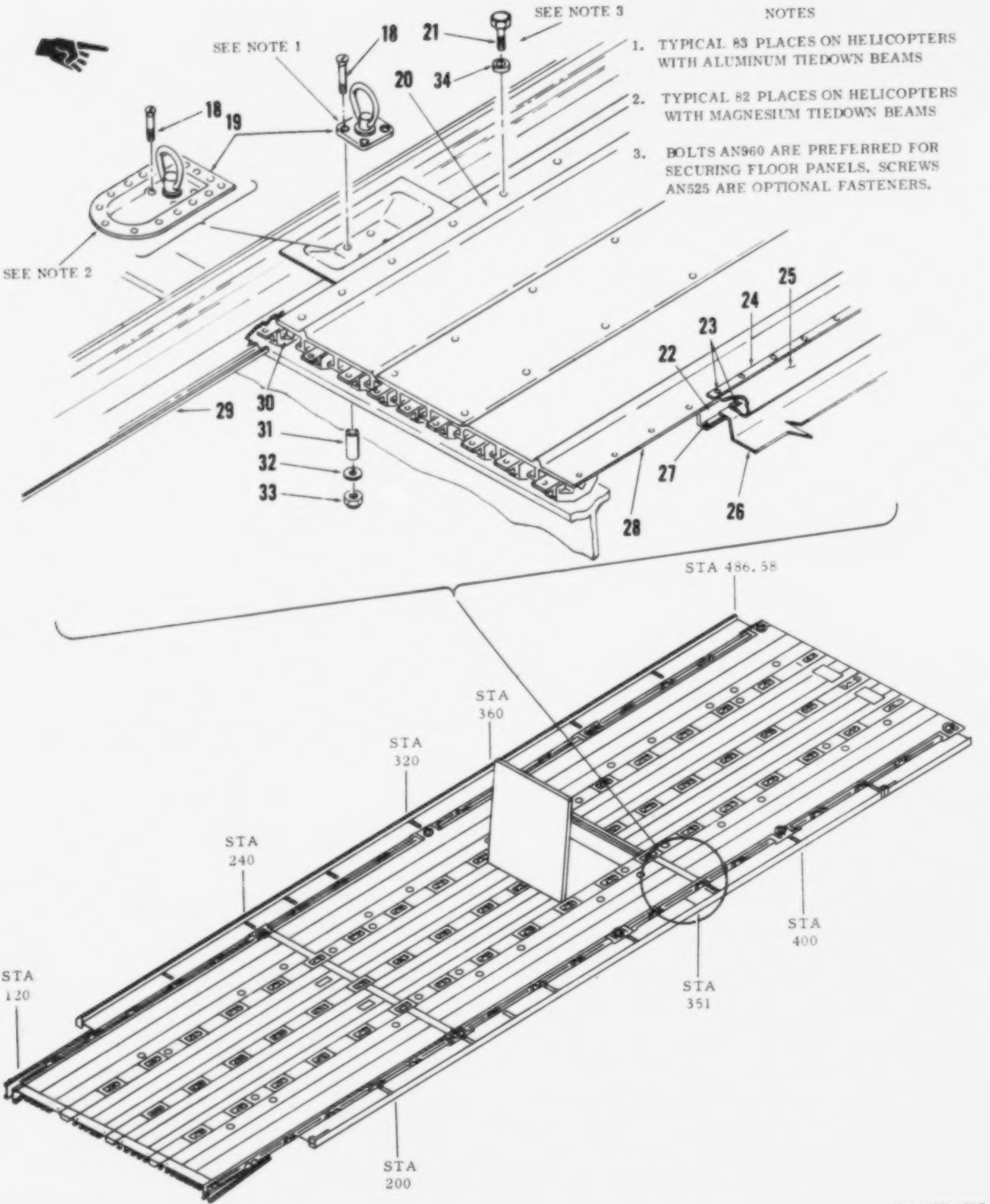

TYPICAL 83 PLACES FOR HELICOPTERS WITH MAGNESIUM TIEDOWN BEAMS
TYPICAL 83 PLACES FOR HELICOPTERS WITH ALUMINUM TIEDOWN BEAMS
2
1
3
4
5
7
17
16
TYPICAL 4 PLACES
STA 486.58
STA 360
7
STA 320
6
8
STA 240
TYPICAL 2 PLACES
15
14
13
STA 120
12
9
10
TYPICAL 8 PLACES
11
8114-325-20F

NOTE

FLOOR PANELS WITH THE SAME INDEX NUMBER ARE INTERCHANGEABLE (LEFT WITH RIGHT)

1. 5,000-pound-capacity tiedown adapter
2. Screw
3. Aft outboard panel (right)
4. Aft inboard panels
5. Aft outboard panel (left)
6. Splice plate
7. Center inboard panels
8. Center outboard panel (left)
9. 10,000-pound-capacity tiedown adapter
10. Plate
11. Adapter
12. Screw
13. Forward outboard panel (left)
14. Forward inboard panels
15. Forward outboard panel (right)
16. Splice plate
17. Center outboard panel (right)
18. Screw
19. Tiedown adapter and ring
20. Floor panel inboard edge
21. ▌ Bolt (see note 3)
22. Upstop
23. ▌ Bolt (see note 3)
24. Seal retainer
25. Seal
26. Tiedown beam (outboard)
27. Bumper
28. Floor panel outboard edge
29. Tiedown beam (inboard)
30. Isolator
31. Spacer
32. Washer
33. Nut
34. ▌ Washer

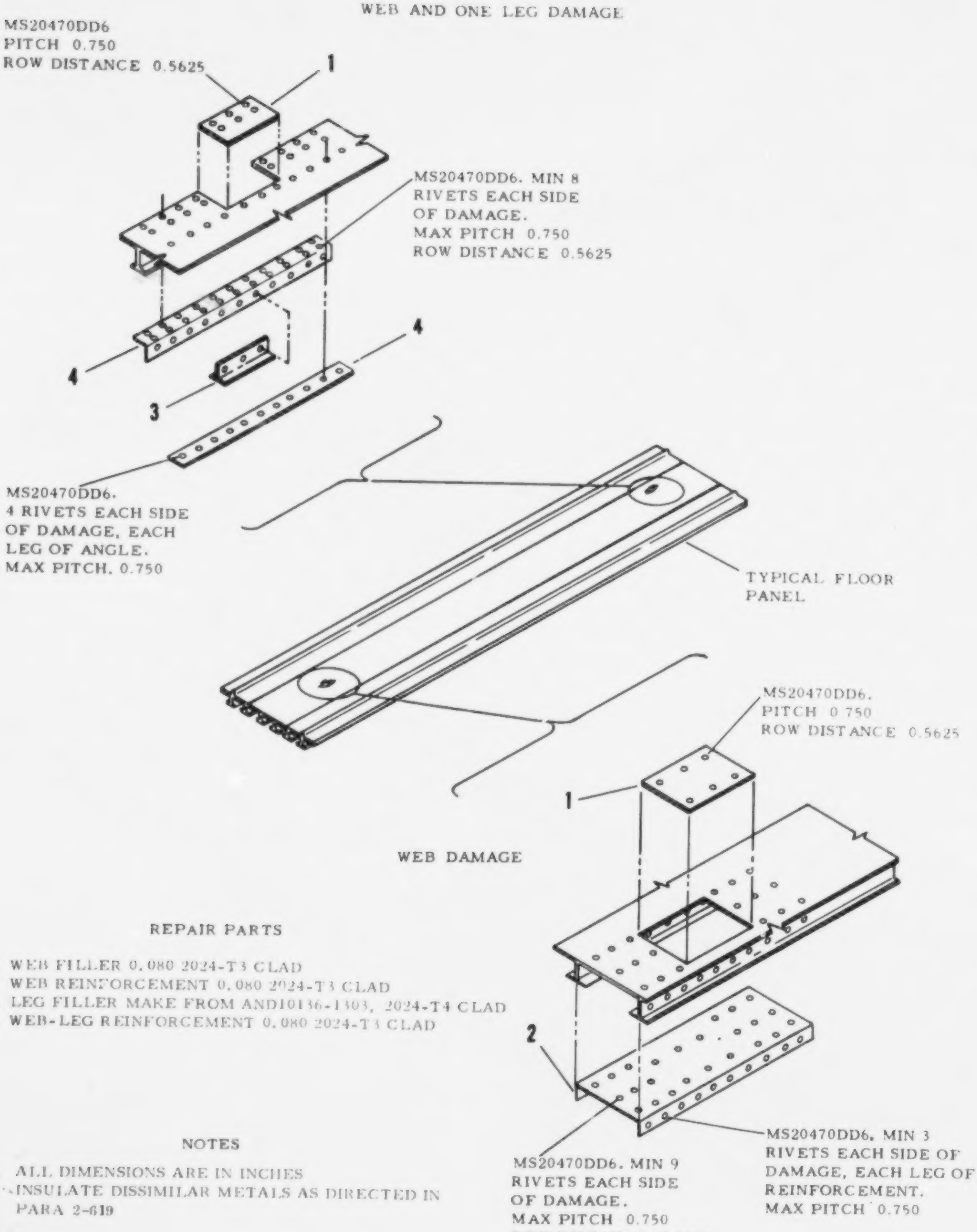
Figure 2-87. Cabin Floor (Sheet 1 of 2)


SEE NOTE 3
SEE NOTE 1
SEE NOTE 2
18
21
34
20
18
19
25
24
23
22
29
30
31
32
33
27
26
28
STA 486.58
STA 360
STA 320
STA 240
STA 120
STA 200
STA 351
STA 400
B114-326-20F
39.5 x 48

NOTES

1. TYPICAL 83 PLACES ON HELICOPTERS WITH ALUMINUM TIEDOWN BEAMS
2. TYPICAL 82 PLACES ON HELICOPTERS WITH MAGNESIUM TIEDOWN BEAMS
3. BOLTS AN960 ARE PREFERRED FOR SECURING FLOOR PANELS. SCREWS AN525 ARE OPTIONAL FASTENERS.

Figure 2-87. Cabin Floor (Sheet 2 of 2)


WEB AND ONE LEG DAMAGE
MS20470DD6
PITCH 0.750
ROW DISTANCE 0.5625
1
MS20470DD6. MIN 8
RIVETS EACH SIDE
OF DAMAGE.
MAX PITCH 0.750
ROW DISTANCE 0.5625
4
4
3
MS20470DD6.
4 RIVETS EACH SIDE
OF DAMAGE, EACH
LEG OF ANGLE.
MAX PITCH. 0.750
TYPICAL FLOOR
PANEL
MS20470DD6.
PITCH 0.750
ROW DISTANCE 0.5625
1
WEB DAMAGE
2
MS20470DD6. MIN 9
RIVETS EACH SIDE
OF DAMAGE.
MAX PITCH 0.750
ROW DISTANCE 0.5625
MS20470DD6. MIN 3
RIVETS EACH SIDE OF
DAMAGE, EACH LEG OF
REINFORCEMENT.
MAX PITCH 0.750
B114 103 34S V

REPAIR PARTS

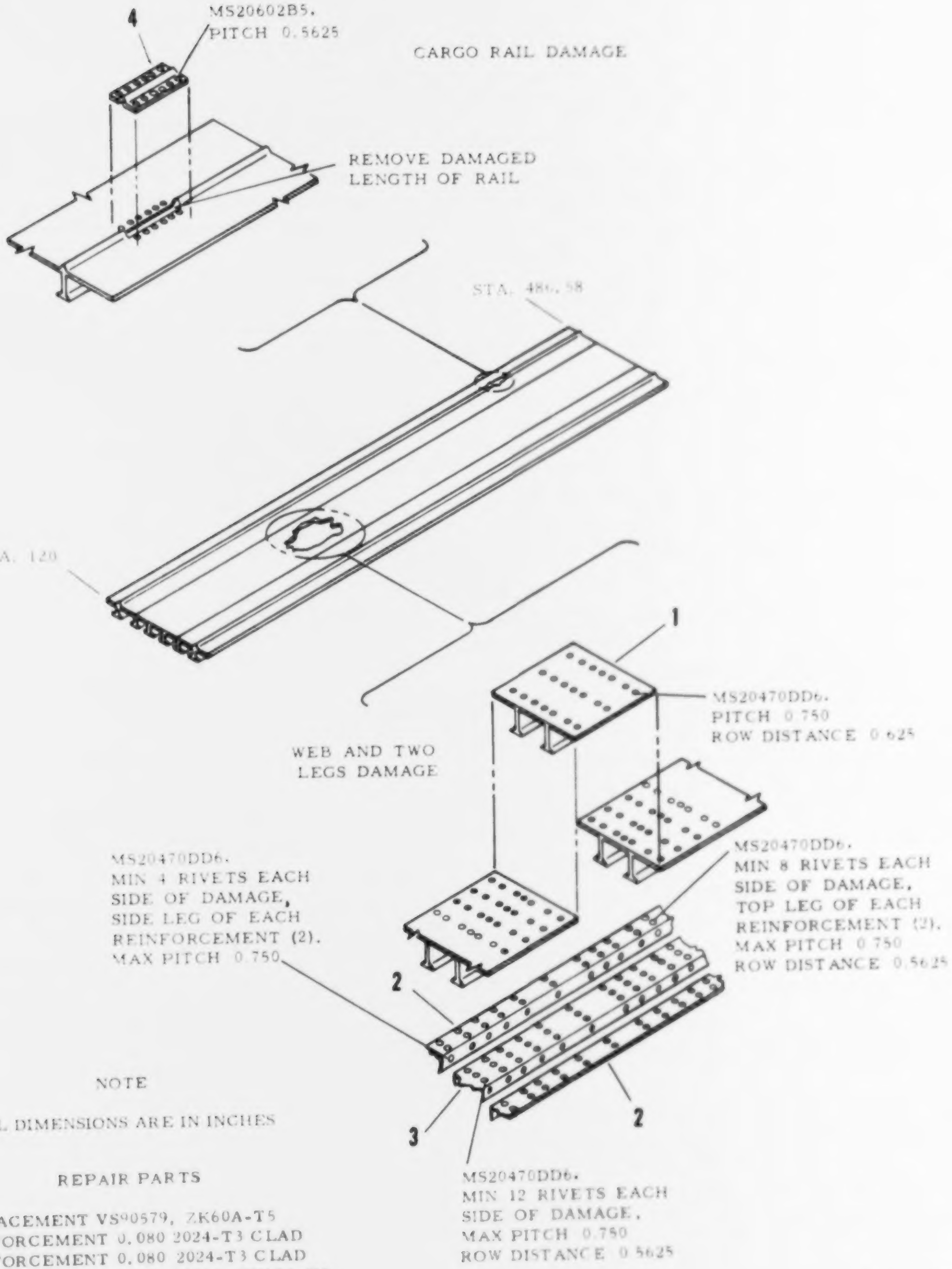
1. WEB FILLER 0.080 2024-T3 CLAD
2. WEB REINFORCEMENT 0.080 2024-T3 CLAD
3. LEG FILLER MAKE FROM AND10136-1303, 2024-T4 CLAD
4. WEB-LEG REINFORCEMENT 0.080 2024-T3 CLAD

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. INSULATE DISSIMILAR METALS AS DIRECTED IN
PARA 2-619

42x51

Figure 2-88. Floor Repairs—Cabin Fuselage Structure Assembly (Sheet 1 of 3)


4
MS20602B5.
PITCH 0.5625
CARGO RAIL DAMAGE
REMOVE DAMAGED
LENGTH OF RAIL
STA. 486.58
STA. 120
1
MS20470DD6.
PITCH 0.750
ROW DISTANCE 0.625
WEB AND TWO
LEGS DAMAGE
MS20470DD6.
MIN 4 RIVETS EACH
SIDE OF DAMAGE,
SIDE LEG OF EACH
REINFORCEMENT (2).
MAX PITCH 0.750
MS20470DD6.
MIN 8 RIVETS EACH
SIDE OF DAMAGE,
TOP LEG OF EACH
REINFORCEMENT (2).
MAX PITCH 0.750
ROW DISTANCE 0.5625
2
2
3
MS20470DD6.
MIN 12 RIVETS EACH
SIDE OF DAMAGE.
MAX PITCH 0.750
ROW DISTANCE 0.5625

NOTE

ALL DIMENSIONS ARE IN INCHES

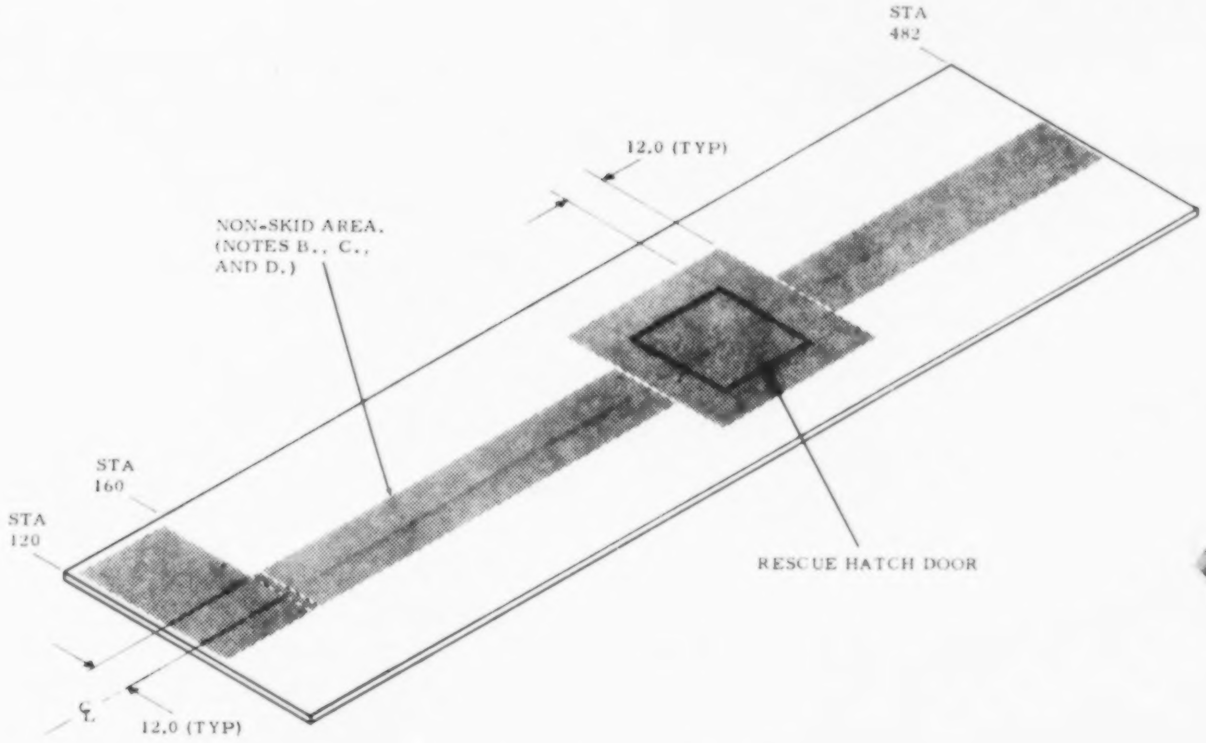
REPAIR PARTS

1. REPLACEMENT VS90579, ZK60A-T5
2. REINFORCEMENT 0.080 2024-T3 CLAD
3. REINFORCEMENT 0.080 2024-T3 CLAD
4. RAIL REPLACEMENT VS90515, ZK60A-T5

8114-104-355F

Figure 2-88. Floor Repairs—Cabin Fuselage Structure Assembly (Sheet 2 of 3)

CARGO FLOORING--APPLICATION OF NON-SKID PAINT


STA
482
12.0 (TYP)
NON-SKID AREA.
(NOTES B., C.,
AND D.)
STA
160
STA
120
RESCUE HATCH DOOR
℄
12.0 (TYP)

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. APPLY NON-SKID PAINT (C230) IF REPAIRS ARE MADE WITHIN WALKWAY AREA OR IF EXISTING COATING IS WORN
C. DO NOT APPLY NON-SKID PAINT TO CARGO TIE-DOWN RETAINERS
D. SEE FIG. 2-129 FOR INFORMATION ON REPLACEMENT OF MARKINGS

42x40

8114 4 34SV

Figure 2-88. Floor Repairs—Cabin Fuselage Structure Assembly (Sheet 3 of 3)

Table 2-10. Floor Panel Corrosion Limitations

AREA	MAXIMUM ALLOWED
Panel surfaces	— 15% reduction in thickness. 1-inch holes providing they are sealed for watertightness and clear legs of panel.
Panel legs	— 10% reduction in thickness. No missing material unrepaired.
Channel, tiedown dishes, splices, and attaching parts	— 10% reduction in thickness.
Overall	— 25% of entire panel affected by any or all of above allowables.

*2-337. **Repair (AVIM).*** Damage more extensive than negligible, affecting only the flat surface of a panel, can be repaired. (See fig. 2-88.) Damage to a panel affecting the flat surface and one or more legs necessitates an insertion-type repair. Where required, apply nonskid paint (C230) to repaired areas. (Refer to para 2-627.) Corrosion, within limitations found in table 2-10, can be removed and treated as follows:

a. Remove affected floor panel. (Refer to para 2-336.)

b. Remove all corrosion. Use abrasive paper (C3 or C4).

c. Treat all bare surfaces in accordance with MIL-M-3171, type I.

d. Spray or brush on one coat of primer (C266), in accordance with MIL-C-8507, and three coats of primer (C258) in accordance with MIL-P-15930.

e. Coat all surfaces, except faying of the riveted or bolted joints and top surfaces of the panel with corrosion preventive compound grade I (C124).

f. Reinstall the panel, using tape (C338) and sealer (C300) on all dissimilar metal and removable faying surfaces or joints. Use tape (C338) under all steel hardware and sealer (C300) at all magnesium-to-magnesium faying surfaces and joints. (See fig. 2-125, sheet 5 for floor panel sealing.)

*2-338. **Replacement of Cargo Tiedown Adapters and Rings.*** (See fig. 2-87.)

a. Replace the 5,000-pound cargo tiedown adapters (19) on magnesium tiedown beams (15) as follows:

(1) Remove floor panel (14) adjacent to the tiedown adapter to be replaced. (Refer to para 2-336.)

(2) Remove the four nuts (33), washers (32), screws (18), and spacers (31).

(3) Replace the tiedown adapter (19). Apply sealing compound (C296) between the mating surfaces.

(4) Install screws (18), wet with zinc chromate primer (C259), spacers (31), washers (32), and nuts (33).

NOTE

If a component of the adapter (19) is to be replaced, refer to para 2-458, steps a.(2) thru a.(4).

(5) Install the floor panel. (Refer to para 2-339.)

b. Replace the 5,000-pound cargo tiedown adapter components on aluminum beams as follows:

(1) Remove floor panel adjacent to the tiedown adapter components to be replaced. (refer to para 2-336.)

(2) Replace the tiedown adapter components. (Refer to para 2-449, steps b.(2) thru b.(4).

(3) Install the floor panel. (Refer to para 2-339.)

c. To replace the 10,000-pound capacity cargo tiedown ring (9), proceed as follows:

(1) Unscrew the tiedown ring (9) and stow it in the container.

(2) If the tiedown ring is not to be reinstalled, install a plug into the receptacle.

(3) If the tiedown ring (9) is to be replaced, screw the replacement tiedown ring (9) into the adapter (11) so the threads of the ring are completely contained within the threads of the adapter (11).

*2-339. **Installation.*** (See fig. 2-87.)

a. Check the floor panel faying surface seal for damage or loss of sealing qualities. Have the seal repaired or replaced if necessary.

NOTE

Bolts AN3 and AN4 with washers AN960 are preferred for securing floor panels. Screws AN525 are optional fasteners.

b. Install all bolts with a coating of wet zinc chromate primer (C259). Seal all openings in the floor panels with sealing compound (C295).

c. Install the four forward panels (13, 14, and 15) as follows:

(1) Forward outboard panel (13 or 15) installation.

(a) Place the floor panel on the support structure. To position either outboard panel, lift the inboard edge of the panel. Slide the panel outboard so the upstops (22) slide under the outboard tiedown beam (26). Slide panel outboard into position.

CAUTION

Do not install outboard floor panel with upstops on top of tiedown beam. Be sure that all upstops slide under beam.

(b) Install isolator mounting screws at aft end of panel.

(c) Install splice plate (16) loosely to panel.

(d) Install bolts with washers loosely along forward edge and both sides of panel.

(e) Fold seal (25) inboard. Secure the seal to panel with seal retainer (24), bolts (23), and washers (34).

(f) Torque bolts.

(2) Forward inboard panel (14) installation.

(a) Place floor panel on support structure.

(b) Install isolator mounting bolts at aft end of panel.

(c) Install the splice plate loosely to panel.

(d) Install bolts and washers loosely along both sides and forward end of panel.

(e) Torque all bolts.

d. Install the four center panels (7, 8, and 17) as follows:

(1) Center outboard panel (8 or 17) installation.

CAUTION

Do not install outboard floor panel with upstops on top of tiedown beam. Be sure that all upstops slide under the beam.

(a) Place floor panel on support structure. To position either outboard panel, lift the inboard edge of the panel. Slide panel outboard so the upstops (22) slide under the outboard tiedown beam (26). Slide panel outboard into position.

NOTE

Bolts AN3 and AN4 with washers AN960 are preferred for secure floor panels. Screws AN525 are optional fasteners.

(b) Install isolator mounting bolts along forward and aft end of panel.

(c) Install splice plates (16) loosely to each end of panel.

(d) Install bolts and washers along inboard side of panel.

(e) Fold seal (25) inboard. Secure the seal to panel with seal retainer, bolts (23) and washers (34).

(f) Torque bolts.

(2) Center inboard panel (7) installation.

(a) Place floor panel on support structure. Slip aft end of panel under flange on rescue hatch frame.

(b) Install isolator mounting bolts and washers.

(c) Install splice plate (16) loosely to forward end of floor panel.

(d) Install bolts and washers loosely along both sides of panel.

(e) Torque bolts.

e. Install the four aft panels (3, 4, and 5) as follows:

(1) Aft outboard panel (3 or 5) installation.

CAUTION

Do not install outboard floor panel with upstops on top of tiedown beam. Be sure that all upstops slide under the beam.

(a) Place panel on support structure. To position either outboard panel, lift inboard edge of panel. Slide panel outboard so the upstops (22) slide under the outboard tiedown beam (26). Slide panel outboard into position.

(b) Install isolator mounting screws.

(c) Install splice plate (6) loosely to forward end of panel.

(d) Install bolts and washers loosely along both sides and aft end of panel.

(e) Fold seal (25) inboard. Secure the seal to panel with seal retainer, bolts and washers.

(f) Torque bolts.

(2) Aft inboard panel (4) installation.

(a) Place panel on supporting structure. Slip forward end of panel under flange on rescue hatch frame.

(b) Install bolts and washers loosely along both sides and at each end of the panel.

(c) Install the floor rescue hatch door as follows:

(3) If the door that was removed is being reinstalled, check the seals around the edges of the door. Replace them if the sealing qualities are impaired. Secure the seals with adhesive (C14).

(4) Position the door to the hatch. Insert the hinge half of the door into the hinge half of the hatch and align the two parts.

(5) Insert the hinge pin into the hinges. Pinch each outboard end of the hinge enough to prevent the hinge pin from sliding out of the hinge.

(6) Check the operation of the latch to make sure the latch secures and releases the door.

(7) Close and latch the door. Check the security of the installation.

2-340. Cabin Equipment.

The cabin equipment includes acoustic insulation (blankets), troop seats, litter provisions, support brackets for the suppressive fire system and the cabin relief tube.

2-341. Acoustic Blankets. (See fig. 2-41.) Thermal-acoustical insulation blankets are installed throughout the cockpit and cabin to reduce the noise level. The acoustic blankets consists of one to three layers of ½-inch thick glass wool batts, quilted and bonded together and faced on both sides. Facings may be vinyl coated glass cloth, neoprene coated nylon, scrim cloth or fiberglass material or backing cloth of 40 or 20 ounces per square yard leaded vinyl. Edges and cutouts are trimmed and bound or coated with a sealant to prohibit fraying. Secured by socket fasteners and pile-and-hook fastening tape, the blankets can easily be replaced. In areas where a component is concealed by the insulation blanket, stenciling is provided for the component location. Cutouts, slots, and zippered access panels are provided for component replacement or checks.

2-342. Cleaning. Proceed as follows:

a. Clean the acoustic insulation blankets. Use solvent (C137).

b. Lightly rub the area to be cleaned. Do not soak the blanket.

2-343. Inspection. Inspect for the following conditions:

a. Tears, cleanliness, fraying.

b. Missing fasteners.

c. Hook and pile fastening tape for condition.

2-344. Removal. (See fig. 2-41.)

a. Pull the edge of the blanket to separate the fastening tape.

b. Unhook the spring hangers from the ends of the rods if a ceiling blanket between sta 160 and sta 440 is to be removed.

c. Pull on the blanket adjacent to the socket fasteners after disengaging the fasteners to remove the blanket.

d. Remove both rods from the blanket if applicable.

e. To remove a sidewall blanket repeat steps a. and c.

2-345. Repair. Repair loose hook or pile fastening tape in the curved sections between wl +33 and bl 30 each side at the formers, sta 160 thru 440, as follows:

a. Drill approximately seven holes, spaced 3½- to 4-inches apart thru the loose tape and the inboard flange of the former. Use a 3/32-inch-diameter drill.

NOTE

Allow approximately ½-inch space from wl +33 and bl 30 when drilling the holes.

b. Install a washer AN960D2 on each rivet MS20470-AD3.

c. Insert rivets thru holes in tape and former. Set rivets.

2-346. *Installation*. (See fig. 2-41.)

NOTE

If all the cabin acoustic insulation is to be installed, it must be started at sta 482 and worked forward.

a. Insert a rod into each side of the blanket if a ceiling blanket between sta 160 and sta 440 is to be installed.

b. Secure the center socket fasteners of the blanket to the ceiling.

c. Connect the spring hangers to the rods when installing blankets between sta 160 and sta 440.

d. Position the blanket to be installed. Align the flaps and cutouts. Align the blanket edges and hook fastening tape with the pile fastening tape. Work the blanket from the center, pulling to make it taut. Secure the side socket fasteners. Press the blanket edges to secure the fastening tape.

e. If a sidewall blanket is to be installed, slide the blanket under the troop seat upper support tube and repeat step d.

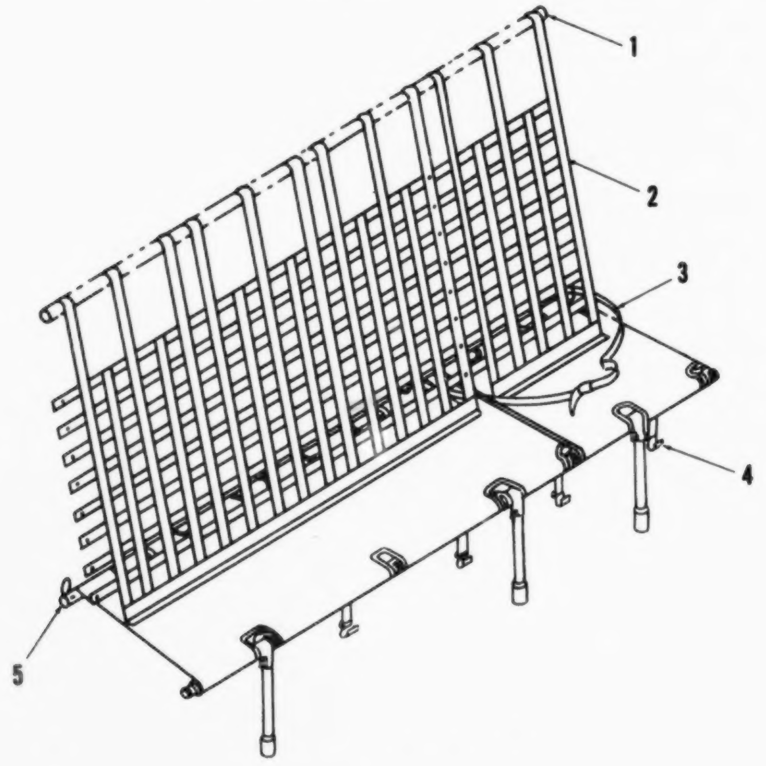
f. Make sure that the cabin ceiling blankets are installed as tightly as possible to minimize dropping. Pay particular attention to the area near the main entrance door where interference could occur.

g. Install ceiling blankets in the radius of the crown snug against the structure.

2-347. *Troop Seats.*

(See fig. 2-89.) There are provisions in the helicopter for the installation of ten three-man troop seats. Five seats are located side-by-side on each side of the cabin. The seats are fastened together by a slide bolt and a latch on the front support tube. There are also provisions for three one-man troop seats: one forward and one aft on the left side, and one aft on the right side.

a. The seat bottom consists of a close-woven fabric (nylon cloth MIL-C-7219) sewn around the seat frame. The fabric bottoms of adjoining seats are fastened together by interlocking slide fasteners (zippers). The seat back is of web construction (MIL-W-4088, type III) and is attached by hooks to a tube at the top of the cabin. The seat back can



42 x 30

1. Upper support tube
2. Adjustable seat back
3. Seat belt
4. Seat stowage strap
5. Lower support rail

Figure 2-89. Troop Seats

be adjusted to a vertical position to accommodate an occupant wearing a back-type parachute. The rear tube of the seat frame is fastened to the fuselage by fittings and quick-release pins. The legs of the seat snap into receptacles in the floor.

b. Two types of stowage strap are provided on the underside of the seats: a buckled type for rolled stowage and a snaphook type for folded stowage. The legs can be folded to suit either method of stowage.

2-348. Cleaning.

a. Clean the metal surfaces with cleaning solvent (C137).

b. Wipe nylon surfaces with a damp cloth.

2-349. Stowing. The troop seats may be stowed either in the folded or rolled position.

a. Folded stowage. Stow the troop seats as follows:

NOTE

If the seats are to be stowed as an assembly, omit step (2).

(1) Release the front legs from the floor attachments. Swing the legs and attached brace tubes up and over the front seat tube to rest on the seat.

(2) Open the zippers that secure the seat to its adjoining seat. Release the latches that secure the front seat tube to its adjoining tubes.

(3) Fold the seat bottom against the fuselage. Engage the seat stowage strap snaphook with the D-ring in the front back.

b. Rolled stowage. Stow the troop seats as follows:

(1) Slacken the seat back supporting straps at the hook attachments.

(2) Disconnect the snap fasteners that secure the seat back.

(3) (See fig. 2-89.) Unhook the seat back (2) from the upper support tube (1). Roll the back down and stow it on the seat.

(4) Release the front legs from the floor attachments. Release the spring catches securing the brace tubes to the front legs. Release the front leg swivel locks. Stow the legs and brace tubes on the seat, along the front seat tube.

(5) Open the zippers that secure the seat to its adjoining seats. Support the seat. Release the latches that secure the front seat tube to its adjoining tubes.

(6) For a three-man seat, remove the nuts and bolts securing the spreader tube to the lower support rail (5). For a one-man seat, remove the quick-release pins. Disengage the spreader socket-ends from the front support tube. Stow the spreader tubes on the seat, along the front seat tube.

(7) Roll the dismantled seat neatly against the fuselage. Secure the rolled seat to the lower support rail with the buckled straps.

2-350. Positioning for Use. (See fig. 2-89.)

a. Folded stowage. Unstow the troop seats as follows:

NOTE

If the right or left seats are stowed as a complete assembly, omit step (2).

(1) Release the stowage strap snaphook from the D-ring in the seat back. Swing the seat down from the fuselage.

(2) Engage the latches to secure the front seat tube to its adjoining tubes. Engage the zippers to secure the seat to its adjoining seats.

(3) Swing the front legs down from the stowed position. Engage the front leg snap locks in the floor attachment fittings.

b. Rolled stowage. Unstow the troop seats as follows:

(1) Unbuckle the stowage straps. Unroll and extend the seat from the fuselage.

(2) Engage the spreader tube socket-ends in the front support tube. Secure the spreader tubes to the lower support rail (5).

(3) Engage the latches to secure the front seat tube to its adjoining tubes. Engage the zippers to secure the seat to its adjoining seats.

(4) Swing the front legs away from the front seat tube to engage the swivel locks. Secure the brace tubes to the front legs. Engage the front leg snap locks in the floor attachment fittings.

(5) Unroll the seat back (2). Hook the seat back onto the upper support tube (1). Connect the snap fasteners to secure the seat back.

(6) Tighten the supporting straps at the hook attachments to tension the seat back.

2-351. Inspection. (See fig. 2-89.)

a. Inspect the structural members for distortion and damage. Replace any defective structural member.

b. Inspect the nylon fabric and webbing for tears, holes, or frayed edges. Replace the fabric or webbing if these conditions exist.

c. Operate the lower legs. Inspect the legs for correct locking and release action.

d. Inspect the surfaces of the seat for projections that could snag and damage the clothing or injure the occupant of the seat. Damage which can be permitted to exist as is or can be corrected by a simple procedure, such as stop-drilling cracks and removal of dents on aluminum alloy tubing, is considered negligible.

2-352. Removal. (See fig. 2-89.)

a. Disconnect the snap fasteners of the seat back tabs which connect the seat backs of adjoining seats together.

b. Provide slack in the seat back by loosening the straps which connect through the slots in the hooks at the top of the seat back. Remove the hooks from the tube. Roll the seat back down until it rests on the seat.

c. Remove seat belts (3).

d. Disengage the interlocking slide fasteners (zippers) on the underside at each end of the seat.

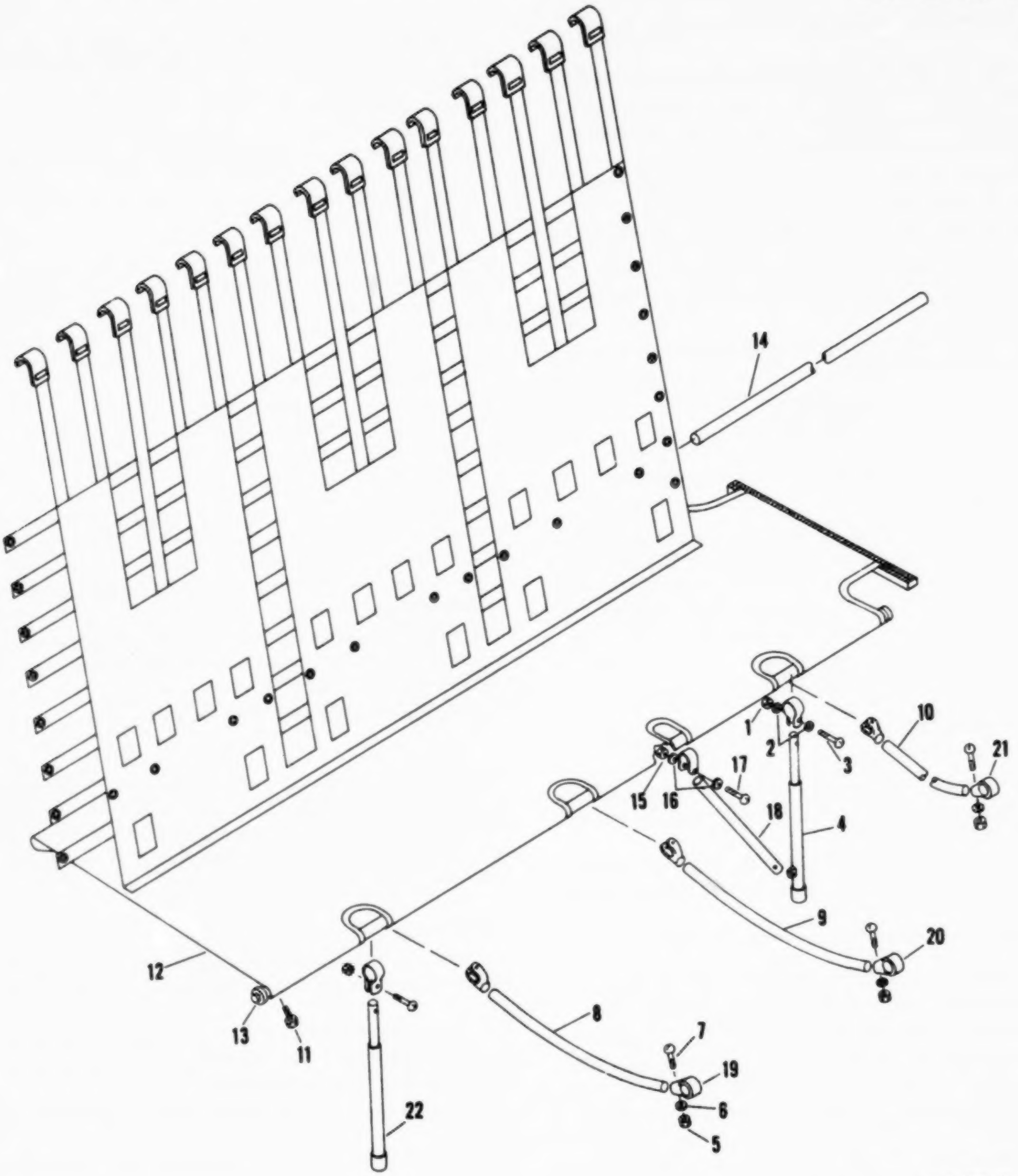
e. Remove the quick-release pins from the rear attachment points of the seat.

f. Release the latches on the front support tube. Retract the slide bolts into the tube.

g. Disconnect the legs from the floor. Remove the seats from the cabin.

2-353. Disassembly of Three-Man Seat. (See fig. 2-90.)

a. Remove the troop seat. (Refer to para 2-352.)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B114-308-20

1. Nut
2. Washer
3. Bolt
4. Leg
5. Nut
6. Washer
7. Bolt
8. Tube spreader
9. Tube spreader
10. Tube spreader
11. Screw
12. Nylon seat assembly
13. Front tube
14. Rear tube
15. Nut
16. Washer
17. Bolt
18. Brace
19. Bracket
20. Bracket
21. Bracket
22. Leg

Figure 2-90. Three-Man Troop Seat

b. Remove nut (15), washer (16), bolt (17), and brace (18).

c. Remove nuts (1), washers (2), bolts (3), and legs (4 and 22).

d. Remove nuts (5), washers (6), bolts (7), brackets (19, 20, and 21) and tube spreaders (8, 9, and 10).

e. Remove screws (11) securing the nylon seat assembly (12) to the front tube (13).

f. Slide rear tube (14) from the nylon seat assembly (12).

2-354. *Assembly of Three-Man Seat.* (See fig. 2-90.)

a. Slide rear tube (14) thru the aft section of the nylon seat assembly (12).

b. Install screws (11) securing the nylon seat assembly (12) to the front tube (13).

CAUTION

Do not tighten the nuts to the extent that they damage the tubes.

c. Position tube spreaders (8, 9, and 10) underneath the nylon seat assembly (12) into the brackets (19, 20, and 21) and across the front and rear tubes. Secure the tube spreaders to the front and rear tubes with the bolts (7), washers (6) under the nuts, and the nuts (5).

CAUTION

Do not tighten the nuts to the extent that they damage the tubes.

d. Secure legs (4 and 22) to the front tube (13) with the bolts (3), washers (2) (one under the bolt head and one under the nut), and the nuts (1).

e. Secure brace (18) to the front tube (13) with the bolt (17), washers (16) (one under the bolt head and one under the nut), and the nut (15).

f. Install the troop seat. (Refer to para 2-358.)

2-355. *Disassembly of One-Man Seat.* (See fig. 2-91.)

a. Remove the troop seat. (Refer to para 2-352.)

b. On seats 114ES018-3, disconnect the lower end of the brace (19) from the leg (4). Remove the cotter pin (20), washer (21), pin (22), brace, and the bracket (23).

c. Remove the nut (1), washer (2), bolt (3), and the leg (4) from the seat assembly.

d. Remove screw (5) and washer (6) and screws (7) securing the nylon seat assembly (8) to the front tube (9).

e. Remove nut (10), washer (11), and bolt (12) from both ends of the spreader tubes (13 and 14); remove the spreader tubes, rear brackets (15), and front brackets (16 and 17).

f. Slide the rear tube (18) from the seat assembly (8).

2-356. *Assembly of One-Man Seat.* (See fig. 2-91.)

a. Slide the rear tube (18) thru the aft section of the seat assembly (8).

b. Secure the seat assembly (8) to the front tube (9), using the screws (7) with washers, and screw (5) with the washer (6).

CAUTION

Do not tighten the nuts to the extent that they damage the tubes.

c. Position the tube spreaders (13 and 14) underneath the seat assembly (8) and to the front brackets (16 and 17) and tube (9) and the rear brackets (15) and tube (18). Secure the tube spreaders to the front brackets (16 and 17) and to the rear brackets (15) with the bolts (12), washers (11) (under the nuts), and the nuts (10).

CAUTION

Do not tighten the nuts to the extent that they damage the tubes.

d. Position the leg (4) on the front tube (9) and secure the leg with the bolt (3), washer (2) (one under the head and one under the nut), and the nut (1).

e. On seats 114ES018-3, connect the brace (19) to the eyebolt (24) on the leg (4).

f. Slide the bracket (23) on the front tube (9) and connect the other end of the brace (19) to the bracket with the pin (22), washer (21), and the cotter pin (20).

g. Install the troop seat. (Refer to para 2-358.)

2-357. *Repair.* Damage to fabric may be repaired (see fig. 2-42). Damage to seat stowage strap, repair by figure 2-42.1. Damage to aluminum alloy tubing, more extensive than that classified as negligible, can be repaired. See fig. 2-18.

2-358. *Installation.* (See fig. 2-89.)

a. Position the rear support tube of the seat into the bracket on the side of the cabin and insert the quick-release pin.

b. Insert the slide bolts in the front support tube of the seat into the latches of the adjoining seats. Engage the interlocking slide fasteners (zippers).

c. Connect the legs of the seat into the receptacles in the floor.

d. Install the seat belts (3). Install two plain ends or two buckle ends (attachment end of the seat belt half) onto the same ring. Use the rings which are spaced 20 inches apart. Alternate the installations except for the installations at the forward and aft ends of the seats in the cabin. Install single seat belt halves at the forward and aft ends of the seat installation.

e. Attach the hooks of the seat back onto the support tube above the seat on the side of the cabin.

f. Adjust the tabs at the hooks to remove the slack from the seat back.

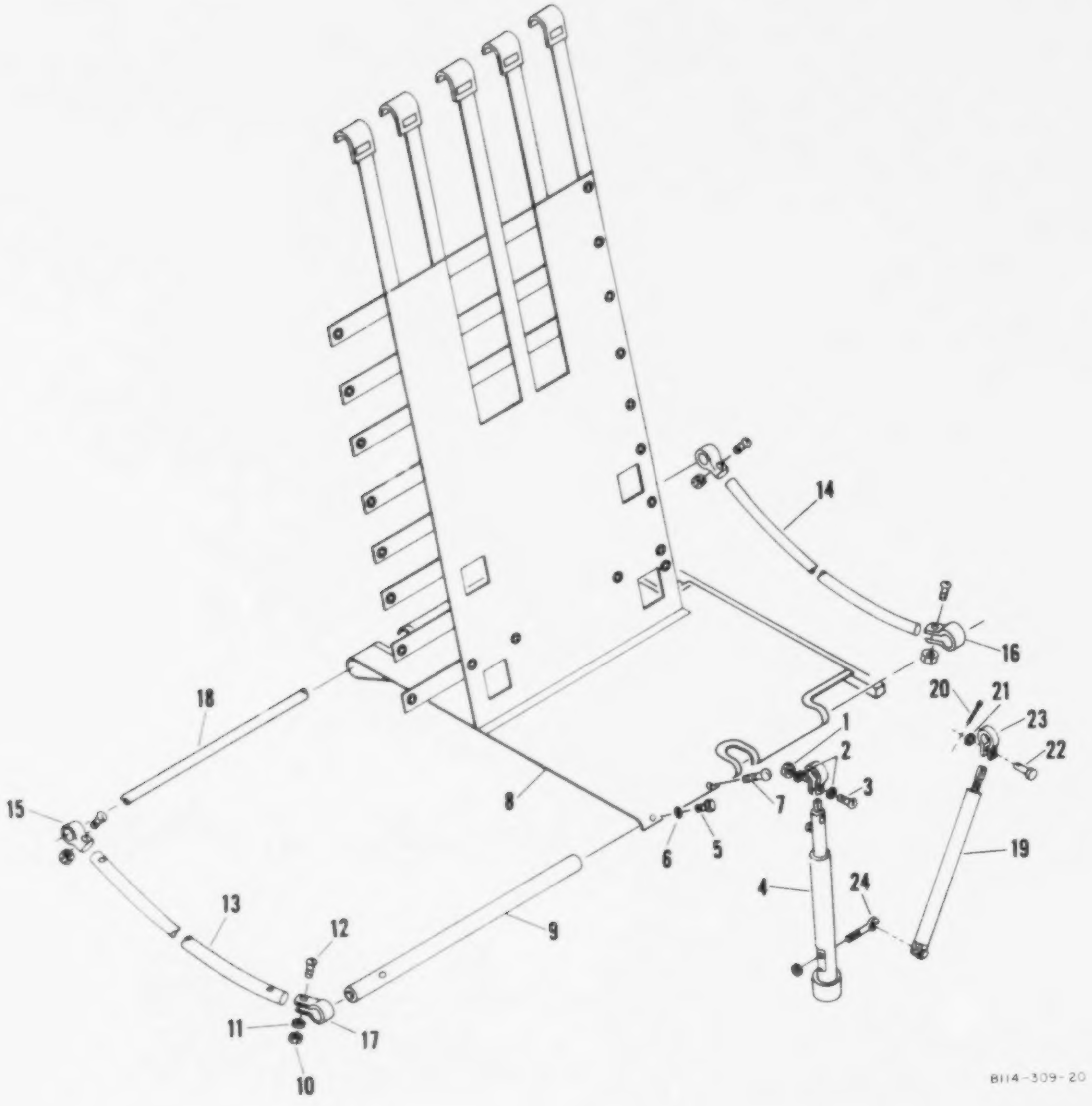
2-359. *Litter Provisions.*

(See fig. 2-92 and 2-93.) There are provisions in the cabin for the installation of 24 letters. The provisions consist of 12 removable litter stanchions and 12 litter straps. Each stanchion and each strap has four litter support brackets attached to it. This permits the installation of up to four tiers of litters.

2-360. Cleaning. Clean the litter as follows:

a. Clean metal surfaces with cleaning solvent (C137).

b. Clean the web straps and litter surface with a damp cloth.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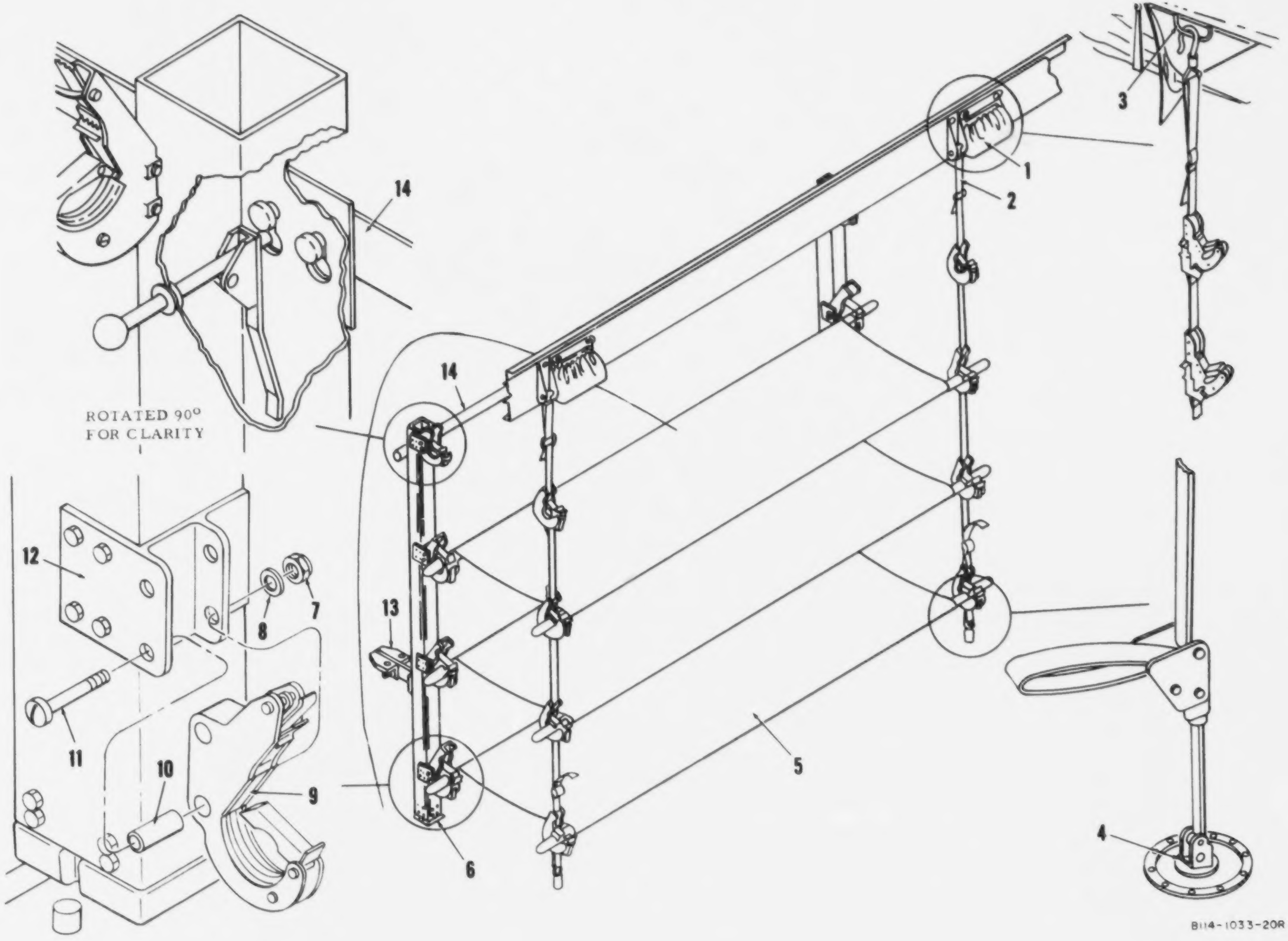
B114-309-20

1. Nut
2. Washer
3. Bolt
4. Leg
5. Screw
6. Washer
7. Screw
8. Nylon seat assembly
9. Front tube
10. Nut
11. Washer
12. Bolt
13. Spreader tube
14. Spreader tube
15. Rear bracket
16. Front bracket
17. Front bracket
18. Rear tube
19. Brace
20. Cotter pin
21. Washer
22. Pin
23. Bracket
24. Eye bolt (open)

Figure 2-91. One-Man Troop Seat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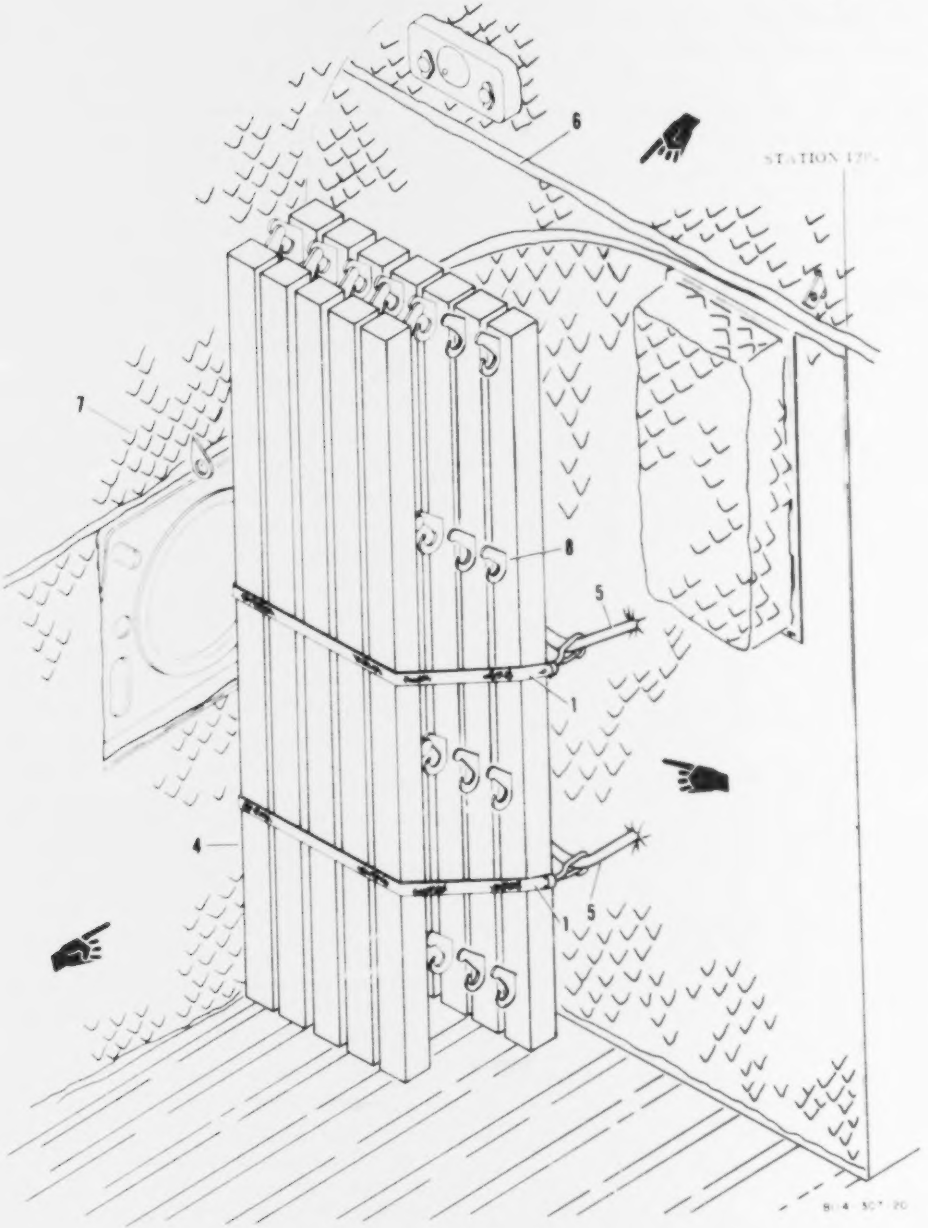
ROTATED 90°
FOR CLARITY
B114-1033-20R

Figure 2-92. Litter Installation



1. Strap assembly
2. Screw
3. Washer
4. Litter pole
5. Guard assembly
6. Electronic compartment
7. Acoustic insulation
8. Litter support bracket

Figure 2-93. Litter Pole Stowage

Legend for figure 2-92

1. Litter support strap container
2. Litter support strap
3. Strap upper attachment fitting
4. Floor receptacle
5. Litter
6. Litter stanchion
7. Nut.
8. Washer
9. Support bracket
10. Spacer
11. Bolt
12. Support
13. Adapter assembly
14. Troop seat support pole

2-361. *Stowage Provisions.* Provisions are also made for stowage of the litter poles at sta 120 on the left side of the cabin. Provisions are made for the stowage of litter straps in 12 containers on the cabin ceiling.

2-362. *Positioning Stanchions and Straps for Use.* Each stanchion rests on the floor between two spacers. The upper end of the stanchion is attached to fittings mounted on the support pole of the troop seat backrest. Each litter strap is attached to an adapter on the floor. A hook at the top of the strap is attached to a fitting installed in the cabin ceiling.

2-363. Inspection of Litter Provisions. (See fig. 2-92.) Inspect for the following conditions:

a. Stanchion hardware attaching holes for wear and cracks.

b. Straps (2) for fraying and general condition.

c. Support brackets (9) for condition.

2-364. Replacement of Stanchion Litter Support Bracket. (See fig. 2-92.)

a. Remove both nuts (7), washers (8), spacers (10) and bolts (11) from the support (12) and remove the support bracket (9).

b. Position the replacement support bracket (9) on the support (12) of the stanchion (6). Make sure that the hook end faces up.

c. Align the holes of the support (12) with the holes in the support bracket (9) of the stanchion. Install the bolts (11), spacers (10), washers (8), and nuts (7).

2-365. Replacement of Litter Support Strap Assembly. (See fig. 2-92.)

a. Release the buckle which is above the lowest litter support.

b. Disconnect the strap lower attachment fitting from the floor receptacle (4).

c. Remove the strap hook from the attachment (3) on the cabin ceiling.

d. Place the hook of the replacement strap over the attachment (3) on the ceiling. Make sure that the supports on the strap face inboard.

e. Connect the attachment fitting on the opposite end of the strap to the receptacle (4) in the floor.

f. Adjust the buckle which is above the lowest support to remove the slack in the strap.

2-366. Cabin Relief Tube.

(See fig. 2-49.) A relief tube is installed on the right side of the cabin between sta 482 and 502. The horn rests in a bracket which is attached to the side of the cabin.

2-367. Cleaning. Refer to para 1-33.

2-368. Inspection.

a. Inspect horn for proper attachment and security.

b. After each flight, inspect the tube and horn for cleanliness.

2-369. Removal. (See fig. 2-49.)

a. Remove the horn (12) from the hose (7).

b. Remove the bracket (11) by removing the screws (8), washers (9), and the nuts (10).

2-370. Installation. (See fig. 2-49.)

a. Install the horn (12) into the hose (7).

b. Install the bracket (11) and secure it with the screws (8), washers (9), and nuts (10).

2-371. Suppressive Fire System Mounting Provisions.

(See fig. 2-94.) Mounting provisions for the suppressive fire system are installed in the helicopter. The mounting provisions consist of five support brackets (4, 6, 7, 11, and 12) and one plate (10). On modified helicopters, one support plate (15) is installed when required.

a. Three brackets are mounted on each side of the helicopter: two at sta 160 and one at sta 120. All brackets are at approximate wl 0.

b. Support plate (10) is on the left side at sta 120 wl 0.

c. Support plate (15) is centrally mounted on the aft edge of the cargo ramp flooring.

2-372. Inspection of Suppressive Fire System Mounting Provisions. Inspect for the following conditions:

a. Support plates for security.

b. Adjacent structure for cracks, wear, distortion and security.

2-373. Removal of Support Brackets. (See fig. 2-94.)

a. Stow the troop seats, when removing a support bracket at sta 160. (Refer to para 2-347.)

b. Remove the acoustic insulation in the area of the support bracket. (Refer to para 2-344.)

c. Remove the nuts (3), washers (2 and 9), bolts (1, 5 or 8), support brackets (4, 6, 7, 11, and 12) and plate (10).

2-374. Installation of Support Brackets. (See fig. 2-94.)

a. Coat the mounting side of all support brackets. Use zinc chromate primer (C259).

b. Install a bracket at sta 160, left side as follows:

(1) Position the bracket on the structure with a washer between the bracket and the structure. Secure the bracket with the bolts (heads forward), with a washer under each head. Install the nuts with a washer under each nut. Do not tighten the nuts at this time.

(2) Fabricate an alignment pin as shown in fig. 2-98.

(3) Insert the alignment pin through the hole in each bracket. **WITH THE HOLES OF BOTH SUPPORT BRACKETS ALIGNED WITH THE PIN, TORQUE THE NUTS OF THE SUPPORT BRACKET TO 50 TO 55 POUND-INCHES.**

(4) Continue with step f.

c. Install a bracket at sta 120, left side as follows:

(1) Position the bracket on the structure with a washer between the bracket and the structure. Secure the bracket with the bolts (heads forward) with a washer under each head. Install the nuts with a washer under each nut.

(2) **TORQUE THE NUTS TO 50 TO 55 POUND-INCHES.**

(3) Continue with step f.

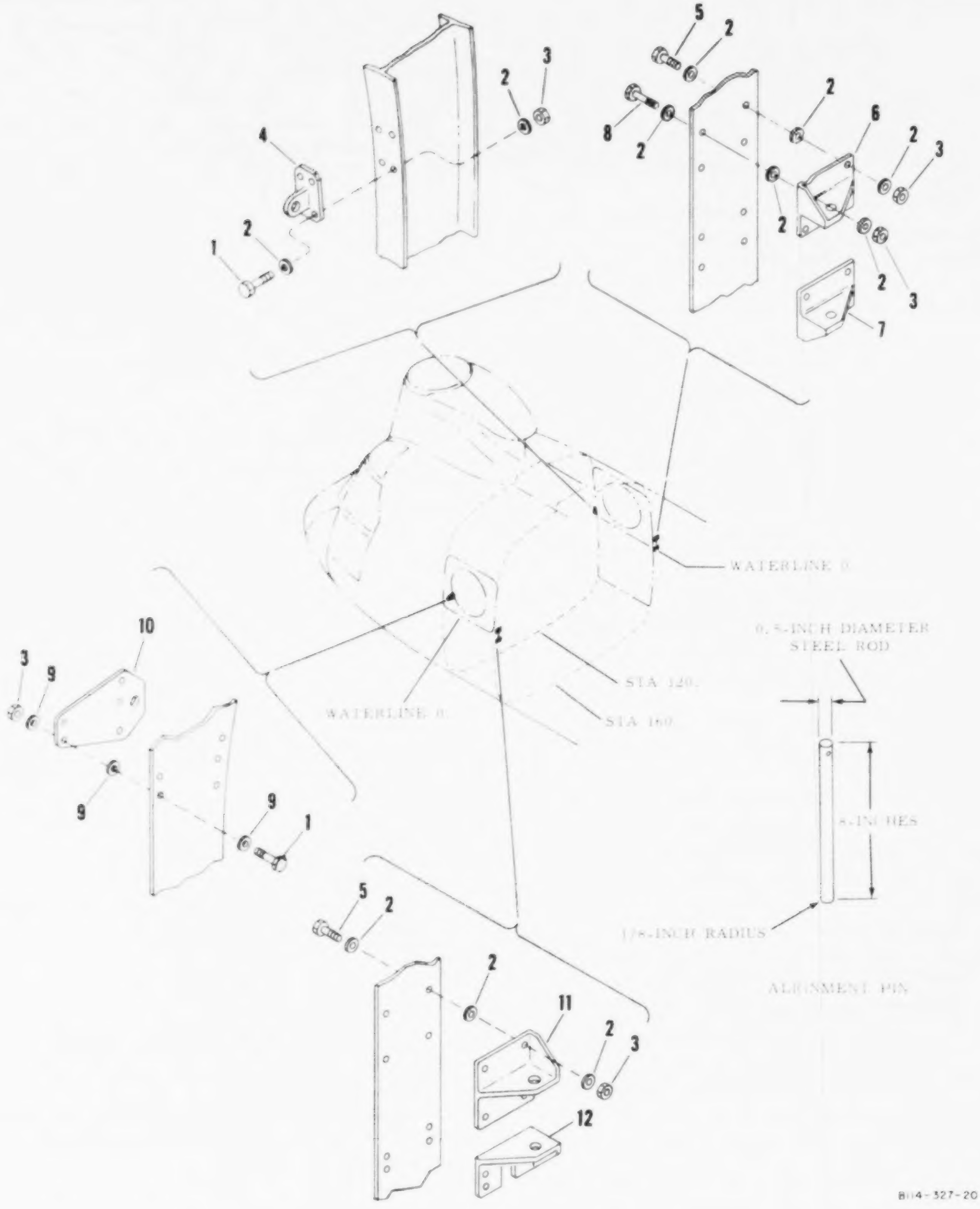
d. Install a bracket at sta 160, right side. Refer to step b.

e. Install a bracket at sta 120, right side as follows:

(1) Position the bracket on the structure and secure the bracket with the bolts (heads inboard) with a washer under each head. Install the nuts with a washer under each nut.

(2) **TORQUE THE NUTS TO 50 TO 55 POUND-INCHES.**

(3) Continue with step f.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WATERLINE 0.
0.5-INCH DIAMETER
STEEL ROD
10
3
9
STA 120.
WATERLINE 0.
STA 160.
9
9
1
8-INCHES
5
2
1/8-INCH RADIUS
2
ALIGNMENT PIN
11
2
3
12
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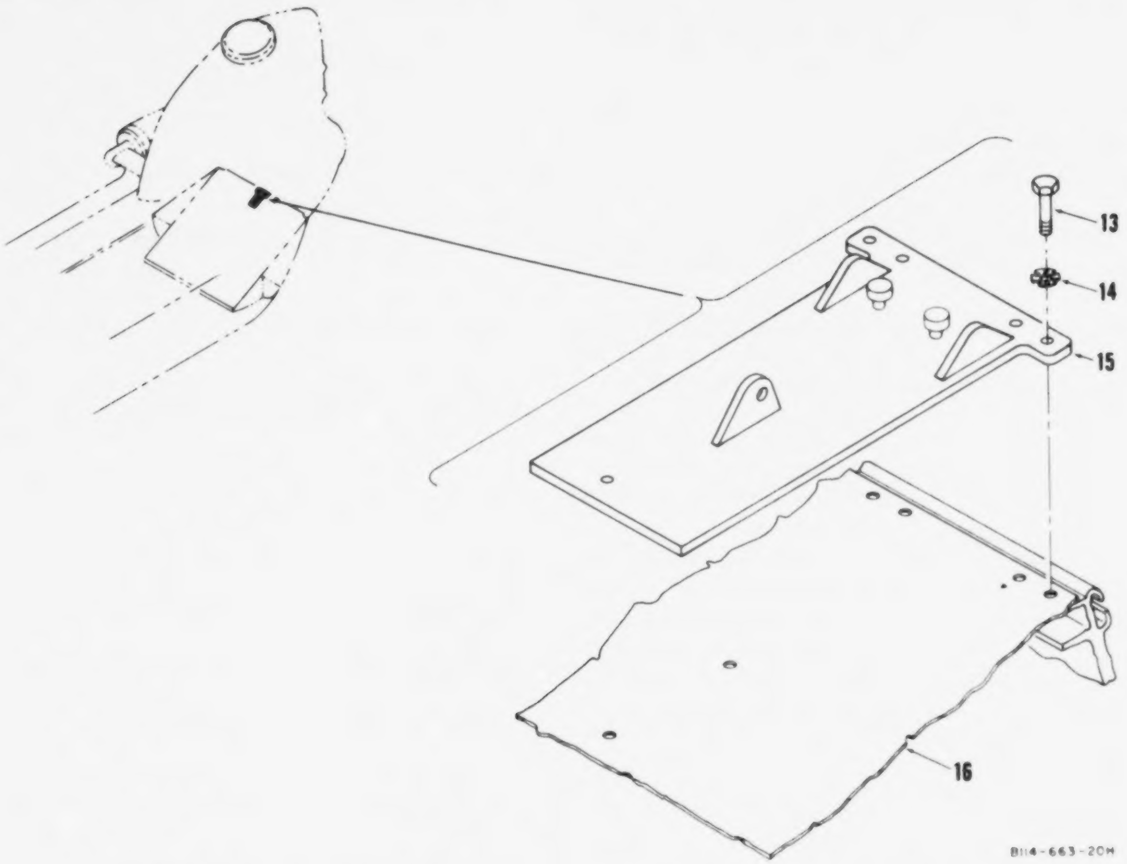
Figure 2-94. Suppressive Fire System Mounting Provisions (Sheet 1 of 2)



1. Bolt
2. Washer
3. Nut
4. Bracket
5. Bolt
6. Bracket
7. Bracket
8. Bolt
9. Washer
10. Plate
11. Bracket
12. Bracket
13. Bolt
14. Washer
15. Plate
16. Ramp floor

Figure 2-94. Suppressive Fire System Mounting Provisions (Sheet 2 of 2)

f. Install the acoustic insulation. (Refer to para 2-346.)

g. If a bracket at sta 160 was replaced, install the troop seats. (Refer to para 2-367.)

2-375. Removal of Support Plate. (See fig. 2-94.) Remove the six bolts (13) and washers (14) securing the plate (15) to the ramp floor (16). Remove the plate.

2-376. Installation of Support Plate. (See fig. 2-94.) Position the plate (15) on the ramp floor (16). Install the six bolts (13) and washers (14).

2-377. Cabin Area Protection System.

When required for the mission, blankets are installed on the CH-47B without the crash resistant fuel system as part of the critical components protective system. Two flame supressing foam blankets (upper and lower) are fitted to each end of each main fuel tank. Hook and pile tape is used to hold the blankets in position. The forward blankets are accessible thru the hinged panel at sta 245. The aft blankets are accessible thru the access panel at sta 385. (See fig. 2-95 and 2-96.)

2-378. Inspection. Inspect the protection blankets for any tears, loose or damaged strips.

2-379. Removal. Proceed as follows:

a. Remove any blanket as follows:

(1) (See fig. 2-95.) Open the hinged panel or remove access panels as required.

CAUTION

Use care when handling the blankets. The outer cover can be easily torn.

(2) Separate the hook and pile fastening tape. Carefully remove the blanket segments from the bulkhead.

b. Remove any pad as follows:

(1) Remove outboard panels of the cabin floor as required for access. (Refer to para 2-336.)

(2) Separate the hook and pile fastening tape. Remove the pad from the inner surface of the cabin fuselage skin.

2-380. Repair. Proceed as follows:

a. Replace damaged blanket segments and pads.

b. If blankets and pads are removed, inspect the hook fastening tape on the tank bulkhead or on the fuselage skin. Replace loose, damaged, or missing tape as follows:

(1) Remove loose or damaged strips.

(2) Clean the bulkhead or skin surface where the strips are to be installed. Use toluene (C362). Apply toluene sparingly with a clean cloth.

(3) (See fig. 2-96.) Obtain replacement strips. Use 1-inch wide tape (C341) cut to length. Mark the outline of each replacement strip on the bulkhead or fuselage skin as applicable.

(4) Apply a thin film of adhesive (C15) to the replacement strips and their mounting surfaces. Let the adhesive dry thoroughly.

(5) Position each strip on its marked outline. Firmly press the bonding surfaces together. Be sure the surfaces mate at all points. Let the bonded joints dry for 24 hours before installing blankets or pads.

2-381. *Installation*. Proceed as follows:

a. (See fig. 2-96.) Check that all closure hook strips are installed on the bulkhead or fuselage skin as applicable. If strips are missing, install new ones. (Refer to para 2-380.)

b. Install any blanket as follows:

(1) (See fig. 2-95.) Install the blanket segments on the bulkhead. Be sure the hook and pile fastening tapes are correctly fastened.

CAUTION

Use care when handling the blanket segments. The outer cover can be easily torn.

(2) Close the hinged panel or install the access panel as applicable.

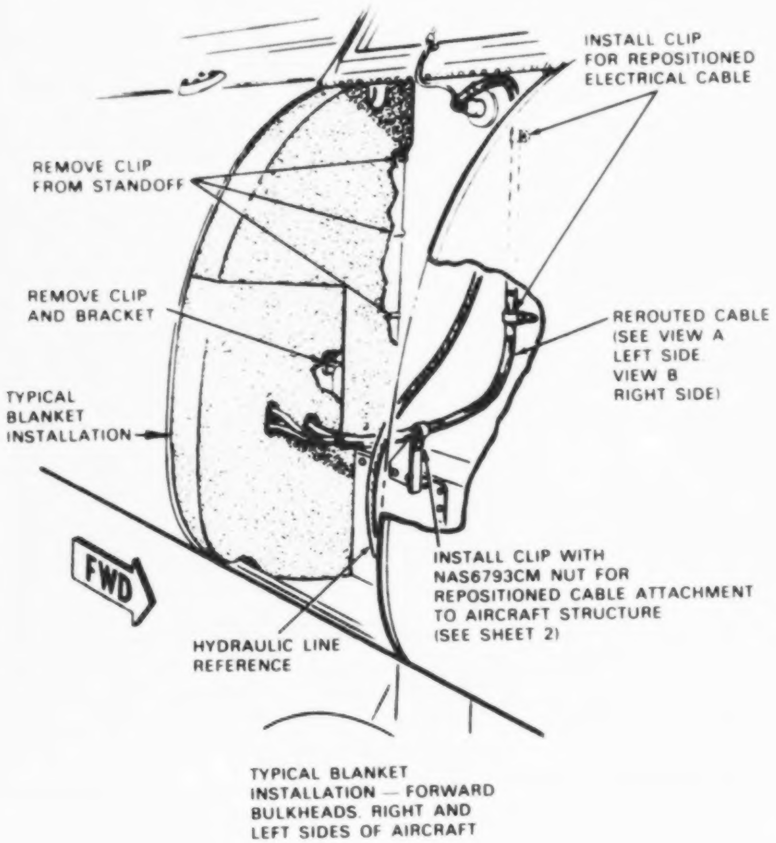
c. Install any pad as follows:

(1) Install the pad on the inner surface of the fuselage skin. Be sure the hook and pile fastening tapes are correctly fastened.

(2) Install the outboard panels of the cabin fuselage floor. (Refer to para 2-339.)

2-382. Aft Fuselage Structure Assembly.

This assembly extends from sta 440 to 630.5 and is spliced at manufacture with the cabin fuselage structure assembly. Watertight flotation sealing must be maintained at wl 0 and below. Weathertight sealing is required above wl 0. Refer to para 2-554 for fuselage sealing requirements. The pod fairing installation, ramp hinge tunnel installation,

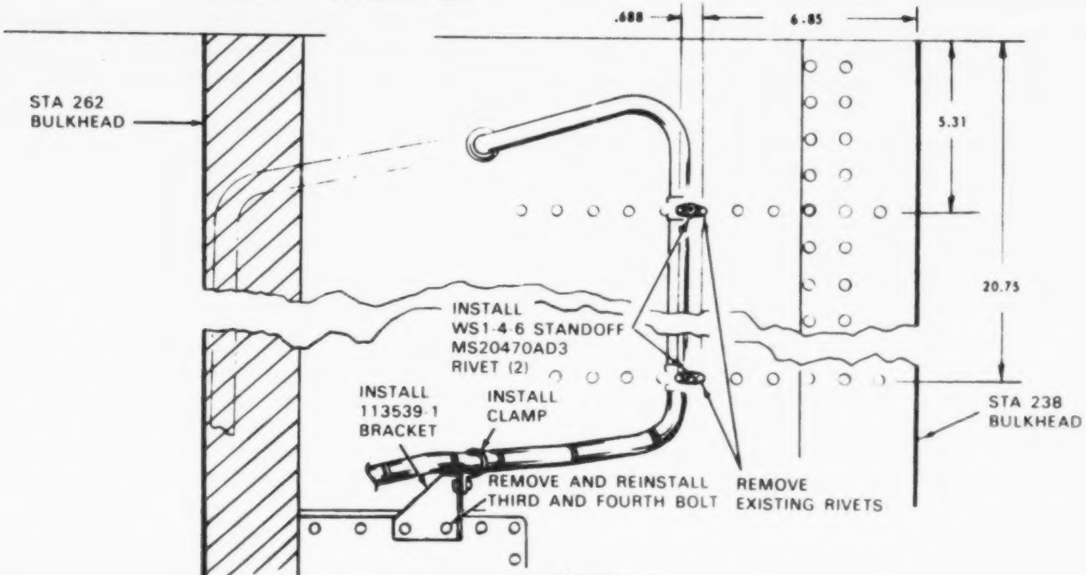

INSTALL CLIP FOR REPOSITIONED ELECTRICAL CABLE
REMOVE CLIP FROM STANDOFF
REMOVE CLIP AND BRACKET
REROUTED CABLE (SEE VIEW A LEFT SIDE VIEW B RIGHT SIDE)
TYPICAL BLANKET INSTALLATION
FWD
INSTALL CLIP WITH NAS6793CM NUT FOR REPOSITIONED CABLE ATTACHMENT TO AIRCRAFT STRUCTURE (SEE SHEET 2)
HYDRAULIC LINE REFERENCE
TYPICAL BLANKET INSTALLATION — FORWARD BULKHEADS. RIGHT AND LEFT SIDES OF AIRCRAFT

39.5 x 30

B114-225-35F

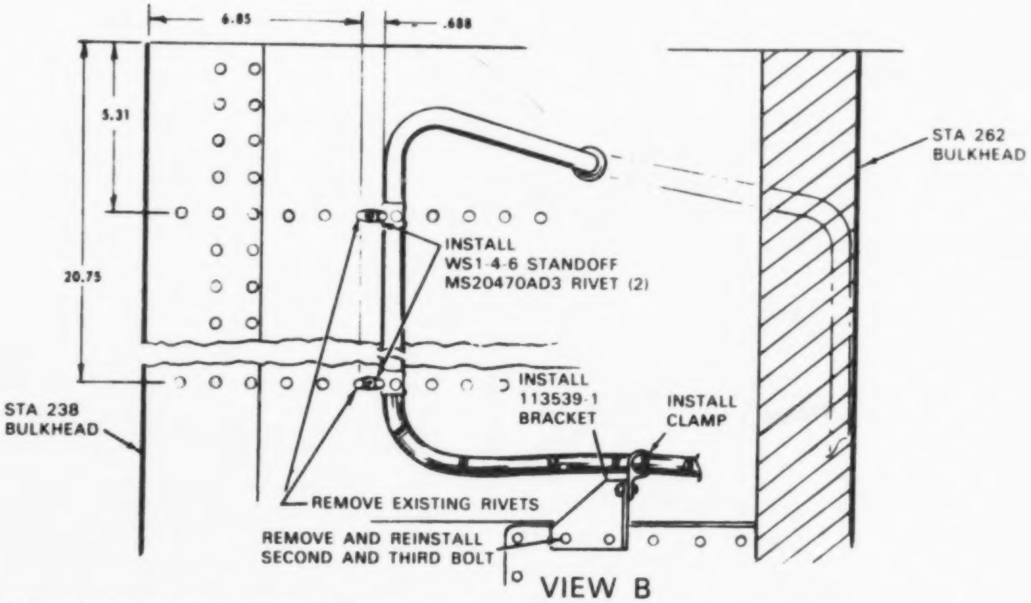
Figure 2-95. Fire Retardant Protection Blanket Installation and Relocation of Electrical Cables (Sheet 1 of 2)

NOTE:
DIMENSIONS FOR REFERENCE ONLY


.688
6.85
5.31
20.75
STA 262
BULKHEAD
INSTALL
WS1-4-6 STANDOFF
MS20470AD3
RIVET (2)
INSTALL
113539-1
BRACKET
INSTALL
CLAMP
REMOVE AND REINSTALL
THIRD AND FOURTH BOLT
REMOVE
EXISTING RIVETS
STA 238
BULKHEAD

VIEW A

STANDOFF AND BRACKET INSTALLATION – RIGHT SIDE OF AIRCRAFT LOOKING INBOARD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STA 262
BULKHEAD
INSTALL
WS1-4-6 STANDOFF
MS20470AD3 RIVET (2)
STA 238
BULKHEAD
INSTALL
113539-1
BRACKET
INSTALL
CLAMP
REMOVE EXISTING RIVETS
REMOVE AND REINSTALL
SECOND AND THIRD BOLT

VIEW B

39.5 x 48 STANDOFF AND BRACKET INSTALLATION – LEFT SIDE OF AIRCRAFT LOOKING INBOARD B114-226-35F

Figure 2-95. Fire Retardant Protection Blanket Installation and Relocation of Electrical Cables (Sheet 2 of 2)

CLOSURE HOOK REQUIREMENTS
(TYPE - NO 80 HOOK SLATE GRAY 320, 1 IN. WIDE)

REFERENCE DASH NUMBER	LENGTH (INCHES)	PIECES REQUIRED	
		RIGHT SIDE	LEFT SIDE
-1	2.0	1	–
-2	7.0	6	7
-3	12.0	2	2
-4	22.0	1	1

FORWARD BULKHEAD, LOOKING AFT

NOTE
BULKHEAD TAPE PATTERN MUST MATCH BLANKET TAPE PATTERN.

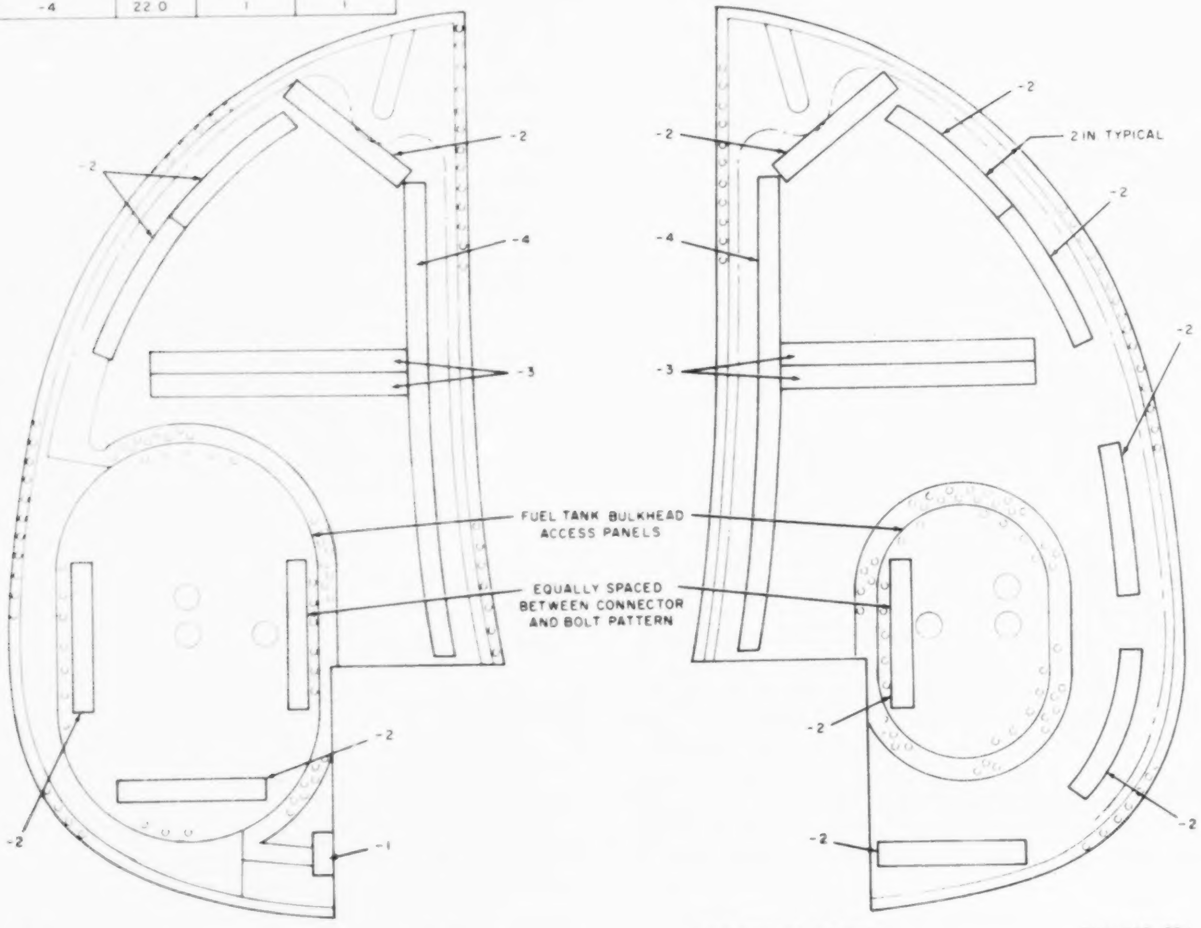

-2
-2
-4
-3
-2
-2
-1
-2
-4
-2
2 IN. TYPICAL
-2
-2
-3
FUEL TANK BULKHEAD ACCESS PANELS
EQUALLY SPACED BETWEEN CONNECTOR AND BOLT PATTERN
-2
-2
-2
42x38
RIGHT SIDE OF AIRCRAFT
LEFT SIDE OF AIRCRAFT
B114-223-35J

Figure 2-96. Bulkhead Closure Hook to Fuel Tank Installation (Sheet 1 of 2)

CLOSURE HOOK REQUIREMENTS
(TYPE-NO. 80 HOOK SLATE GRAY 320, 1 IN. WIDE)

REFERENCE DASH NUMBER	LENGTH (INCHES)	PIECES REQUIRED	
		LEFT SIDE	RIGHT SIDE
-1	2.0	1	3
-2	7.0	7	6
-3	12.0	2	2
-4	22.0	-	-
-5	28.0	1	1

AFT BULKHEAD, LOOKING FORWARD

NOTE:
BULKHEAD TAPE PATTERN MUST MATCH BLANKET TAPE PATTERN

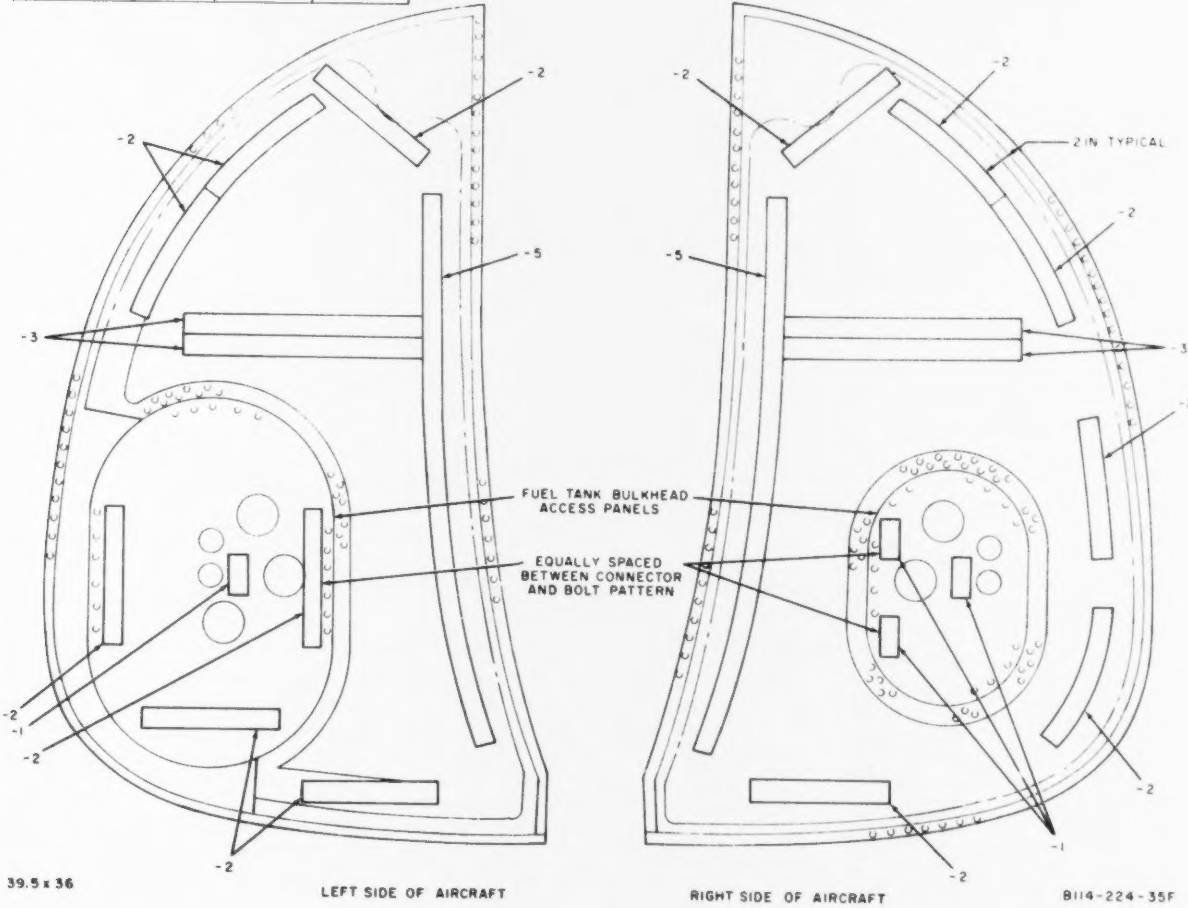

-2
-2
-5
-3
-2
-1
-2
-2
FUEL TANK BULKHEAD ACCESS PANELS
EQUALLY SPACED BETWEEN CONNECTOR AND BOLT PATTERN
-2
-2
-5
-2
2 IN. TYPICAL
-2
-3
-2
-2
-1
-2
39.5 x 36
LEFT SIDE OF AIRCRAFT
RIGHT SIDE OF AIRCRAFT
B114-224-35F

Figure 2-96. Bulkhead Closure Hook to Fuel Tank Installation (Sheet 2 of 2)

the cargo loading ramp installation, the ramp actuator support structure and tail cone of the auxiliary power unit are part of the aft fuselage structure assembly.

2-383. Fairings, Doors and Access Panels—Aft Fuselage.

Components warranting damage classifications and repair information in this section are fairings for the engine, aft fairing, lower pylon leading edge, drive shaft and engine mechanical transmission, and lower work platforms.

2-384. Drive Shaft and Engine Mechanical Transmission Fairing.

(See fig. 2-97.)The fairing extends laterally from the lower pylon leading edge hinged fairing to the engine on each side of the helicopter along fuselage sta 462.95. The shell assembly and drive shaft covering, made of 6061-T6 aluminum alloy, is reinforced by angles, formers, and channels of the same material or 2024-T4 clad aluminum alloy.

2-385. Inspection. Inspect for damage which can be permitted to exist as is or can be corrected by a simple procedure, such as stop-drilling cracks and the removal of dents or burnishing of scratches. Damage is negligible, providing the damage clears all fasteners and radii a minimum of ¾ inch. See fig. 2-3 and 2-6 for examples of negligible damage to formed metal parts and skin panels.

2-386. Repair. (See fig. 2-97.)

a. Damage exceeding negligible limits can be repaired by patching provided that it is confined to 50 percent or less of the cross section of the damaged part.

b. (AVIM). Damage in excess of that considered reparable by patching can be repaired by insertion. See fig. 2-7 for typical repair information on skins.

c. Hinge Pin Repair (figure 2-97.3).

(1) Remove each hinge pin and shorten it so that it does not enter the end loop at each end of the hinge.

(2) Clean the end loops of the hinge with methyl ethyl ketone or other non-residue solvent.

(3) Install the pin so that it does not enter the end loops.

(4) Fill the end loops with sealant MIL-S-8802.

2-387. Aft Fairing.

There are two fairings, one on each side of the aft cabin assembly. The fairing is made from laminated, plastic-impregnated glass cloth. It is attached to the aft section between sta 460 and 482 at wl 72.

2-388. Inspection. Inspect for nicks and scratches that can be removed by burnishing. Stop-drilled cracks and holes not exceeding limits shown in fig. 2-6 may be plugged with a type A rivet or temporarily covered with a patch. Damage must clear each bolt, rivet, and radius a minimum of ¾ inch.

2-389. Repair. (See fig. 2-97.)

a. Damage exceeding negligible limits, but affecting not more than one-half the cross section of the formed part or skin area between formers can be repaired by patching.

b. (AVIM). Damage in excess of that considered reparable by patching can be repaired by insertion. See fig. 2-7 for typical repair information on skins.

2-390. Lower Pylon Leading Edge Fixed Fairing.

The fairing is located between sta 440 and 482 and wl +56 and +72. The fairing consists of laminated, plastic-impregnated glass cloth skins riveted to ribs made of 2024-T4 clad aluminum alloy. Angles, beams, and gussets of formed 2024-T4 clad aluminum alloy are attached to skins to stiffen and reinforce them where repaired.

2-391. Inspection. Inspect for damage to impregnated glass cloth skins. Negligible damage is limited to small voids, small wrinkles, and small cracks which can be stop-drilled. Holes with a temporary patch may not exceed the limits shown in fig. 2-6. See fig. 2-3 for examples of damage to formed metal parts.

2-392. Repair. (See fig. 2-97.)

a. Refer to TM 55-1500-204-25/1 and TB746-93-2 for damage classifications for impregnated glass cloth skins. Damage to formed metal parts not affecting a radius can be repaired by patching.

b. (AVIM). Damage to formed metal parts, affecting a radius or a major portion of the cross section should be repaired by insertion. For typical repairs to formed metal parts, refer to TM55-1500-204-25/1. A repair for a gap between the lower pylon leading edge fixed fairing and drive shaft and engine mechanical transmission fairing is shown in fig. 2-97, sheet 4.

2-393. Lower Pylon Leading Edge Hinged Fairing.

The fairing is located between sta 440 and 475 and wl +56 and +72. On certain helicopters, the fairing is made of laminated, plastic-impregnated glass cloth skins formed over ribs and formers of aluminum alloy. (See fig. 2-97, sheet 1.) On other helicopters, fairings are of sandwich honeycomb construction. (See fig. 2-97, sheet 2.) The sandwich consists of a nonmetallic honeycomb core between laminated, plastic-impregnated glass cloth skins. Hinges are provided on each side at sta 473.0, wl +72.

2-394. Inspection. Inspect for damage to impregnated glass cloth skins. Damage is limited to small voids and wrinkles, and to cracks which can be stop-drilled. See fig. 2-3 for examples of negligible damage to formed metal parts.

2-394.1. Removal. (See fig. 2-118.)

a. Remove the upper latch (1) and lower (2). Open the hinged clamshell doors.

b. Rotate the fasteners (1) ccw to unlocked position.

c. Raise fairing (6) and secure it with the retaining strap.

d. Disconnect the bonding wires (2) from the fairing.

e. Disconnect the combining transmission two oil check light wires at the quick-disconnect splice (3).

f. Support the fairing (5), then remove hinge pins (4).

g. Remove the lower pylon leading edge fairing.

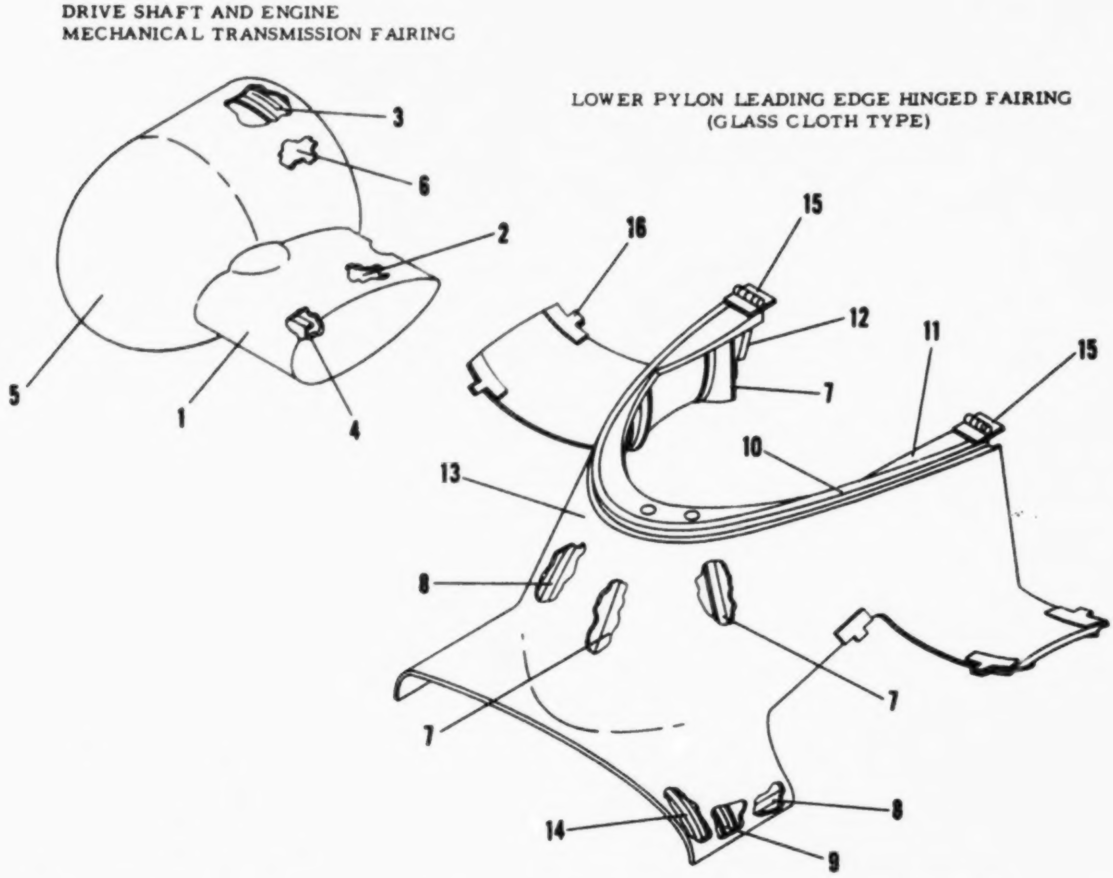
2-395. Repair (AVIM). Refer to TM 55-1500-204-25/1 for damage classifications for impregnated glass cloth skins and for typical repairs to formed metal parts. For reparable damage to sandwich honeycomb structures, refer also to TB746-93-2.

2-395.1. Installation. (See fig. 2-97.1.)

a. Align the hinge of the leading edge fairing with the hinge half on the airframe.

b. Install the hinge pin (4).

c. Connect the combining transmission two oil check light wires at the quick-disconnect splice (3).


DRIVE SHAFT AND ENGINE
MECHANICAL TRANSMISSION FAIRING
LOWER PYLON LEADING EDGE HINGED FAIRING
(GLASS CLOTH TYPE)
3
6
2
5
1
4
16
15
12
11
15
7
10
13
8
7
7
14
8
9

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	OUTER SKIN	0.032 6061-T6 BARE	0.050 6061-T6 BARE
2	INNER SKIN	0.032 6061-T6 BARE	0.050 6061-T6 BARE
3	HAT	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
4	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
5	OUTER SHELL	NOTE B.	6061-T6 BARE
6	INNER SHELL	NOTE B.	6061-T6 BARE
7	RIB	0.020 6061-T6 BARE	0.032 6061-T6 BARE
8	STRIP	0.016 2024-T4 CLAD	0.020 2024-T3 CLAD
9	SHIELD	3-PLY GLASS CLOTH	NOTE C.
10	MEMBER	4-PLY GLASS CLOTH	NOTE C.
11	FORMER	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
12	CHANNEL	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
13	SKIN	3-PLY GLASS CLOTH	NOTE C.
14	ANGLE	0.020 6061-T6 BARE	0.025 6061-T6 BARE
15	HINGE HALF	- -	NOTE D.
16	DOUBLER	0.025 2024-T4 BARE	0.032 2024-T3 CLAD

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE OUTER AND INNER SHELLS VARY IN THICKNESS BETWEEN 0.025 AND 0.040. THE INNER SHELL MAY BE 0.060 MAXIMUM THICKNESS AT THE NOSE SECTION. REPAIR SHOULD BE MADE USING THE SAME MATERIAL AND THICKNESS AS ORIGINAL

C. THE SKIN IS LAMINATED POLYESTER IMPREGNATED NO. 181 GLASS CLOTH MIL-P-8013, TYPE I

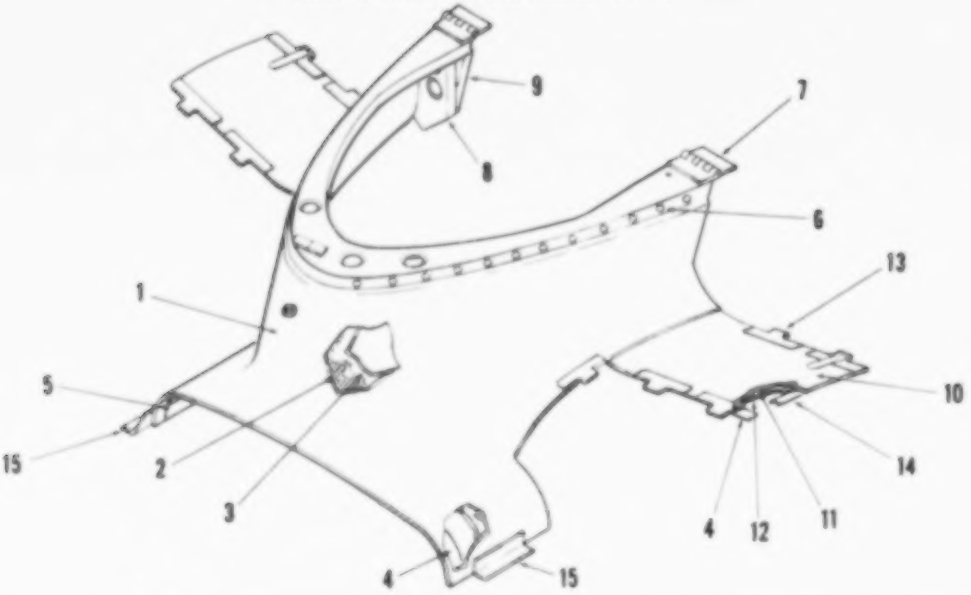
D. REPLACE WITH NEW HINGE HALF MS20001P12-7200 AND HINGE PIN MS20253-2

42x53

B114-230-345V

Figure 2-97. Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 4)

LOWER PYLON LEADING EDGE HINGED FAIRING
(NONMETALIC HONEYCOMB TYPE)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BONDED ASSEMBLY, OUTER SKIN	3-PLY, NO. 181 GLASS CLOTH	NOTE B.
2	CORE	HONEYCOMB-NONMETALIC	NOTE C.
3	BONDED ASSEMBLY, INNER SKIN	3-PLY, NO. 181 GLASS CLOTH	NOTE B.
4	EDGE STRIP	0.016 2024-T3 CLAD	NOTE D.
5	EDGE STRIP	0.020 2024-T3 CLAD	NOTE D.
6	BUMPER	NO. 60-045	NOTE E.
7	HINGE	MS20001P12	NOTE F.
8	CHANNEL	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
9	RIB	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
10	BONDED ASSEMBLY	3-PLY, NO. 181 GLASS CLOTH	NOTE B.
11	CORE	HONEYCOMB-NONMETALIC	NOTE C.
12	BONDED ASSEMBLY	3-PLY, NO. 181 GLASS CLOTH	NOTE B.
13	DOUBLER	0.025 2024-T3 CLAD	NOTE G.
14	EDGE STRIP	0.020 2024-T3 CLAD	NOTE D.
15	ANGLE	BAC 1503-2731 7075-T6	NOTE I.

NOTES

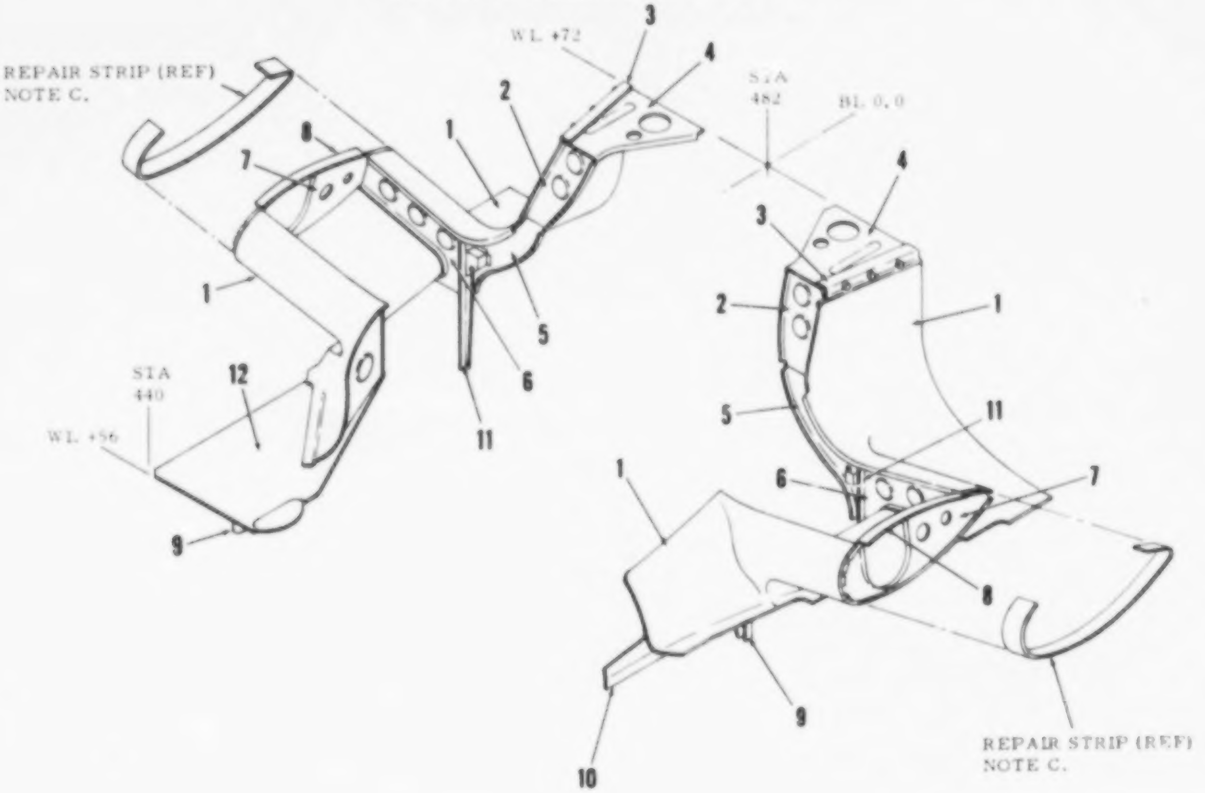
A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO PARA 2-628 FOR REPAIRS TO GLASS CLOTH
C. HONEYCOMB MATERIAL IS NONMETALIC CORE, NOMEX CLASS IV TYPE VI OR TYPE I, GRADE 3.0. REFER TO PARA 2-631 FOR REPAIR TO SANDWICH STRUCTURES
D. REPLACE EDGE STRIP WITH SAME MATERIAL AS ORIGINAL. BOND WITH ADHESIVE (C90). REFER TO PARA 2-540
E. REPLACE WITH NEW PART, SAME AS ORIGINAL, BOND WITH ADHESIVE (C48)
F. REPLACE WITH NEW HINGE HALF MS20001P12 AND HINGE PIN MS20253-2
G. REPLACE DOUBLER WITH SAME MATERIAL AS ORIGINAL. BOND WITH ADHESIVE (C90). REFER TO PARA 2-540
H. SKIN IS GLASS REINFORCED PLASTIC, NO. 181 GLASS CLOTH, TYPE I
I. REPLACE WITH ANGLE MADE FROM BAC 1503-2731 7075-T6

42x51

B114-440-545V

Figure 2-97. Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 4)

LOWER PYLON LEADING EDGE FIXED FAIRING


REPAIR STRIP (REF)
NOTE C.
W.L. +72
3
4
2
1
8
7
1
STA
482
BL 0.0
4
3
2
1
5
6
11
STA
440
12
W.L. +56
9
5
11
6
7
1
8
9
10
REPAIR STRIP (REF)
NOTE C.

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SKIN	3-PLY, NO. 181 GLASS CLOTH	NOTE B.
2	RIB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
3	EDGE MEMBER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
4	PAN	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
5	RIB	0.025 6061-T6 BARE	0.032 6061-T6 BARE
6	RIB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
7	RIB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
8	CAP	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
9	GUSSET	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
10	BEAM	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
11	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
12	PAN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD

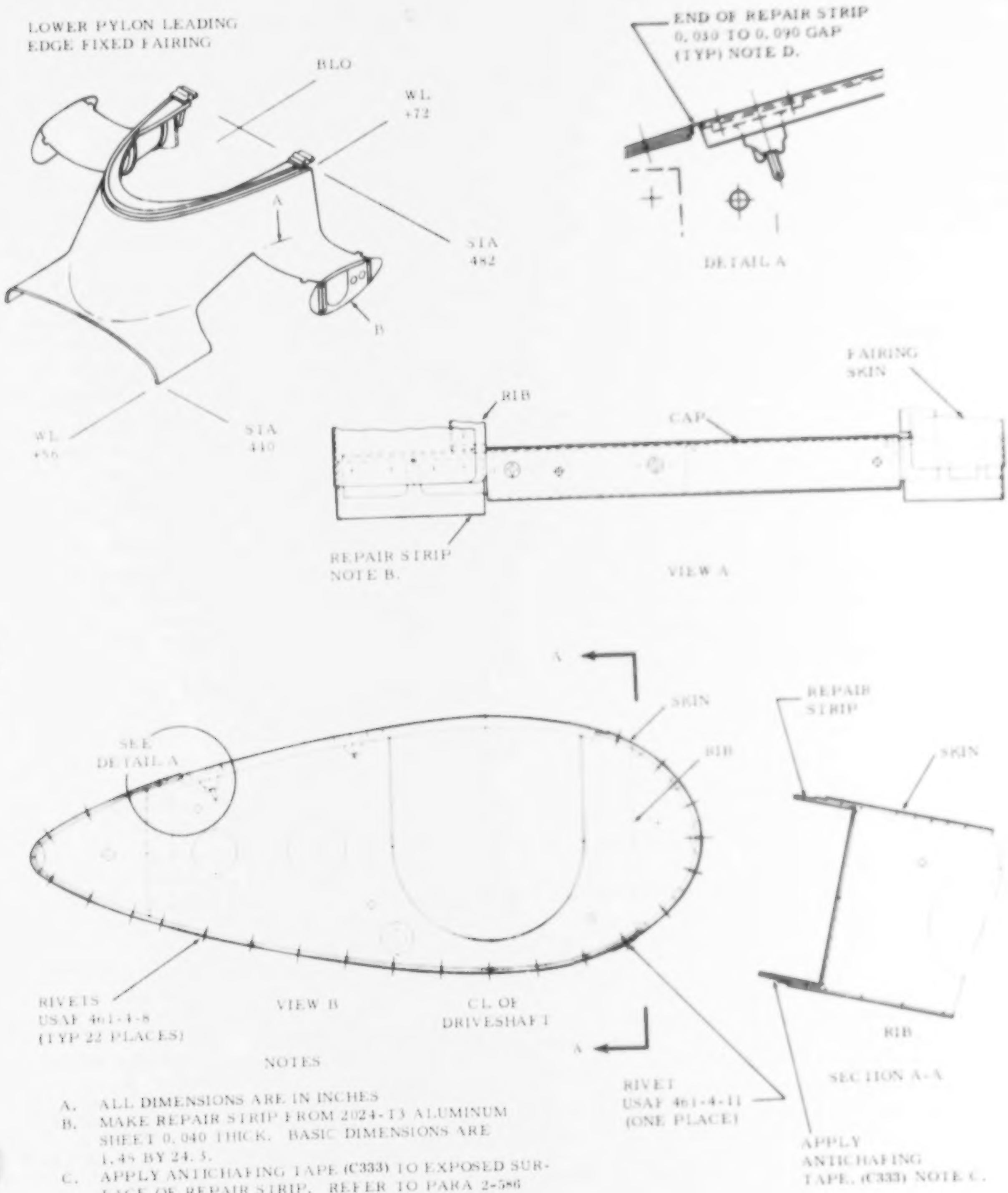
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIRS TO GLASS CLOTH
C. FABRICATE REPAIR STRIPS AND INSTALL WITHIN FLANGES OF RIBS TO CORRECT GAPS BETWEEN HINGED AND FIXED FAIRING.

42x51

B114-490-345V

Figure 2-97. Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 4)


LOWER PYLON LEADING EDGE FIXED FAIRING
BLO
WL +72
A
STA 482
B
WL +56
STA 440
END OF REPAIR STRIP 0.030 TO 0.090 GAP (TYP) NOTE D.
DETAIL A
FAIRING SKIN
RIB
CAP
REPAIR STRIP NOTE B.
VIEW A
A
SKIN
SEE DETAIL A
RIB
REPAIR STRIP
SKIN
RIVETS USAF 461-4-8 (TYP 22 PLACES)
VIEW B
CL OF DRIVESHAFT
A
RIVET USAF 461-4-11 (ONE PLACE)
RIB
SECTION A-A
APPLY ANTICHAFING TAPE, (C333) NOTE C.

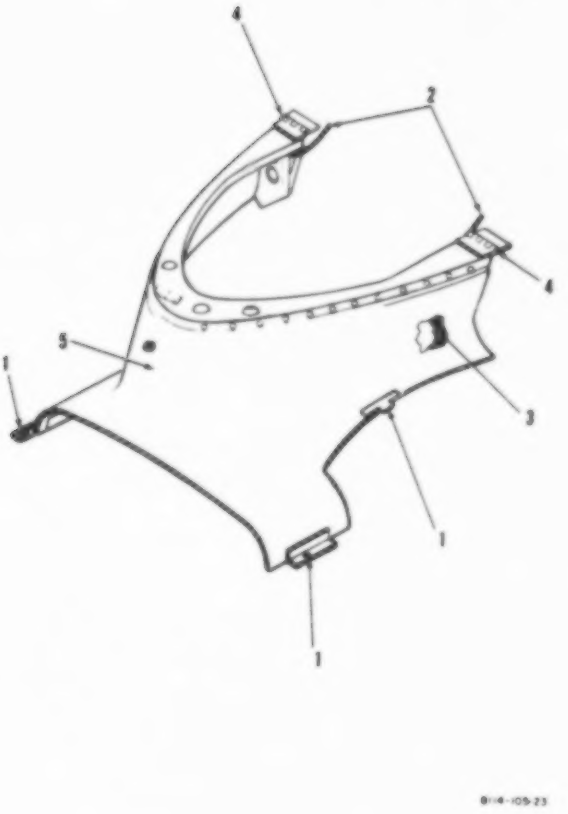
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. MAKE REPAIR STRIP FROM 2024-T3 ALUMINUM SHEET 0.040 THICK. BASIC DIMENSIONS ARE 1.45 BY 24.3.
C. APPLY ANTICHAFING TAPE (C333) TO EXPOSED SURFACE OF REPAIR STRIP. REFER TO PARA 2-586
D. TRIM REPAIR STRIP, AFTER INSTALLATION, AS REQUIRED TO PROVIDE PROPER FIT WITH THE DRIVE SHAFT AND ENGINE MECHANICAL TRANSMISSION FAIRING

42 x 54

B114-577-345V

Figure 2-97. Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 4 of 4)


4
2
4
5
1
3
1
1
B114-105-23

1. Fastener
2. Bonding wire
3. Wire/quick-disconnect
4. Hinge pin
5. Fairing

Figure 2-97.1. Pylon Lower Leading Edge Fairing Installation

d. Connect the bonding wires (2) to the lower fairing (5).

e. Close the lower pylon leading edge fairing.

f. Secure the fairing with fasteners (1).

g. (See fig. 2-118.) Close the clamshell doors.

h. Lock the upper latch and lower (1), then lower the latch (2).

2-396. Strakes.

A typical strake consists of three formed sections of aluminum alloy. The strakes are attached to the under side of the ramp and extend from ramp sta 44.09 to ramp sta 101.39. On helicopters 71-20956 and subq and field modified helicopters, the strakes extend from ramp sta 60.63 to ramp sta 101.39. The shorter strakes provide clearance for skis. Refer to para 2-399 for modification of strakes on helicopters prior to 71-20956.

2-397. Inspection. Inspect for nicks, scratches, and small cracks which can be corrected by stop-drilling.

2-398. Repair. Damage exceeding the limits for negligible damage should be repaired.

2-399. Strake Alteration. (See fig. 2-12, sheet 9.) On helicopters preceding 71-20956 it is necessary to alter the strakes when skis are installed. The alteration provides adequate clearance between the skis and the ramp strakes when the helicopter is on a hard surface with the ramp lowered. Proceed as follows:

a. Remove the rivets securing covers 114S6502-43 and -45 for access to the inside of the shelf of the ramp. Retain the covers.

b. Remove the rivets securing the nose strake. Discard the strake.

c. Remove the rivets, screws, washers, and nuts securing the center strake between ramp sta 49.60 and ramp sta 68.246.

d. Trim the center strake and discard the forward section.

e. Position a strap under the skin. Secure it in place using existing rivet locations.

f. Position the former and clip between ramp sta 53.04 and ramp sta 60.63. Secure it in place using rivets and a screw, washer, and nut.

g. Install a nose strake. Secure it in place using rivets, screws, washers, and nuts.

h. Fill the remaining unused mounting holes. Use rivets, screws, washers, nuts, and sealant (C300).

i. Reinstall covers 114S6502-43 and -45. Use rivets MS20600AD4.

2-400. Pod Fairing Installation—Aft Fuselage Structure Assembly.

This installation is attached to the pod section and the aft fuselage structure assembly at sta 458 and 510. It consists of the aft landing gear access panel, pod fairing assembly, and a hinged work platform and fairing assembly. The access panel is hinged to the lower edge of the pod fairing assembly. The work platform is riveted to a fairing assembly and contains hinges and support struts.

2-401. Access Panel—Aft Landing Gear.

(See fig. 2-98.) An access panel is hinged to the lower edge of the pod fairing on each side of the aft cabin section. Each panel consists of an inner and outer skin made of aluminum alloy. Five formers made of aluminum alloy are attached between the skins at sta 482, 483.75, 496, 504, 513.25, and 519.7.

2-402. Inspection. Inspect for damage which can be corrected by a simple procedure, such as stop-drilling cracks, removal of dents, or burnishing of scratches. Temporary patching of cracks or small trimmed holes is permissible. Damage must clear each bolt, rivet, and radius a minimum of ¾ inch.

2-403. Removal. (See fig. 2-97.2.)

a. Unlatch, then open the strap for the access panel.

b. Remove the bolt securing the strap to the pod fairing.

c. Remove the hinge pin securing the access panel to the pod fairing.

2-404. Repair. (See fig. 2-98.)

a. Damage exceeding negligible limits can be repaired by patching provided that it is confined to those areas between formers for the skin and does not exceed more than one-half of the cross section of any former or its flange.

b. (AVIM). Damage which exceeds the limits described for patching can be repaired by insertion. See fig. 2-7 for typical repair information on the skins.

2-405. Installation. (See fig. 2-97.2.)

a. Align the access panel hinge half to the pod fairing and install the hinge pin.

b. Attach strap assembly to the pod fairing.

c. Close and latch the access panel.

2-406. Pod Fairing Assembly.

(See fig. 2-110.) This fairing assembly is made of aluminum alloy and is riveted to formers of aluminum alloy.

2-407. Inspection. Inspect for nicks and scratches that can be removed by burnishing. Stop-drilled cracks and holes not exceeding limits shown in fig. 2-6 can be plugged with a type A rivet or temporarily covered with a patch. Damage must clear each bolt, rivet, and radius a minimum of ¾ inch.

2-408. Repair. (See fig. 2-98.)

a. Damage exceeding negligible limits, but affecting not more than one-half the cross section of the formed part or skin area between formers can be repaired by patching.

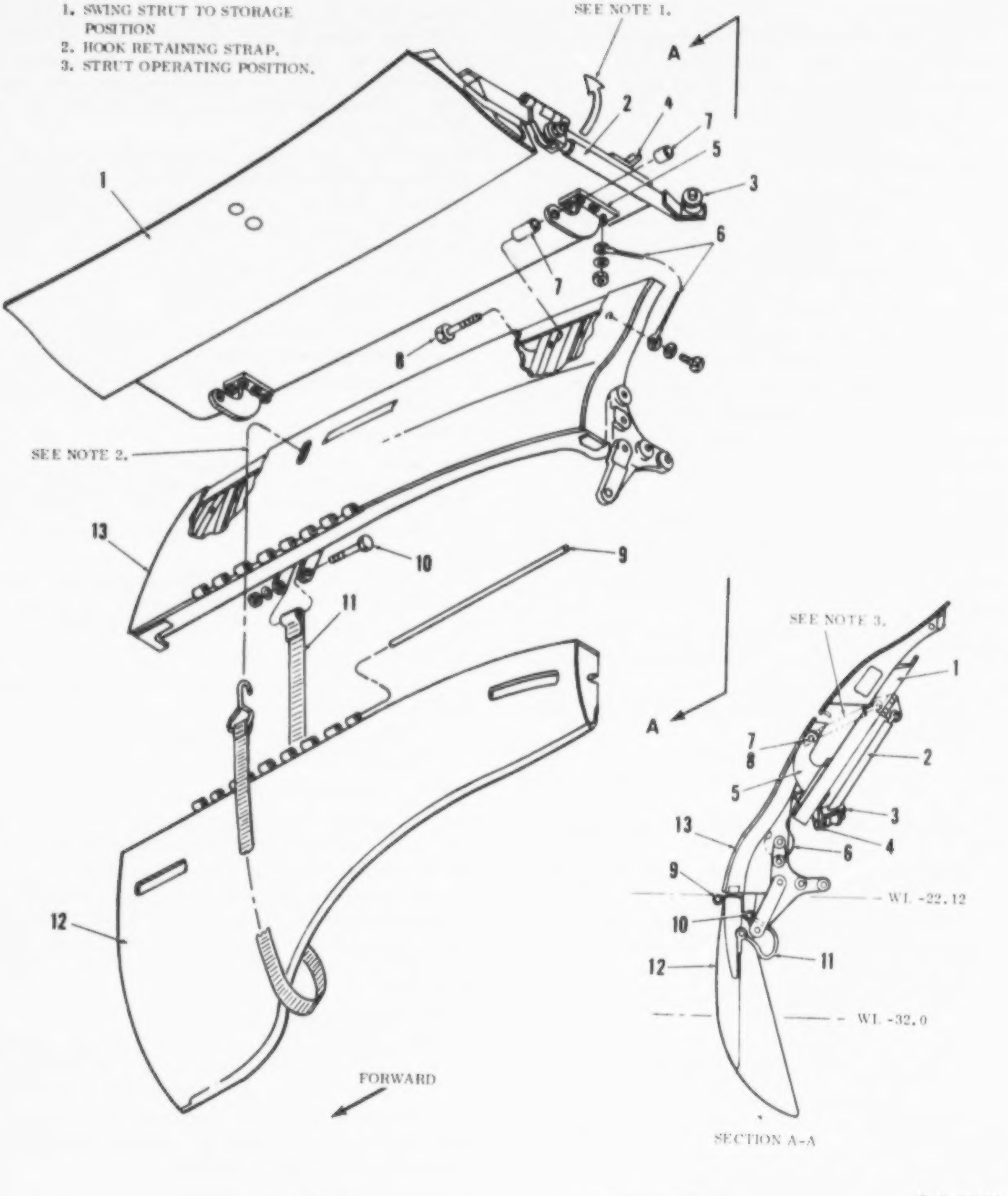
b. (AVIM). Damage affecting more than one-half the cross section of the formed part or skin area between formers can be repaired by insertion.

2-409. Work Platform and Fairing Assembly.

(See fig. 2-98.) The work platforms are located on each side of the aft fuselage assembly between sta 482 and 520, and are hinged to the inside of the pod fairing. The outer skin of the platform is made of aluminum alloy. The floor of the platform is attached to stiffeners. The stiffeners are attached to the inside of the fairing skin. The floor of the

NOTES

1. SWING STRUT TO STORAGE POSITION
2. HOOK RETAINING STRAP.
3. STRUT OPERATING POSITION.


SEE NOTE 1.
A
2
4
7
5
3
1
6
7
8
SEE NOTE 2.
13
10
9
11
12
FORWARD
A
SEE NOTE 3.
1
7
8
2
5
3
13
6
4
9
— WL -22.12
10
11
12
— WL -32.0
SECTION A-A
B114-96-23

1. Work platform
2. Spring strut
3. Strut latch
4. Strut storage clip
5. Platform hinge
6. Bonding cable
7. Hinge bushings
8. Platform hinge pin
9. Access panel hinge pin
10. Strap bolt
11. Strap
12. Landing gear access panel
13. Pod fairing

Figure 2-97.2. Aft Landing Gear and Work Platform Fairing

platform is sandwich-honeycomb construction with the top skin rigidized. Walkway material is applied to the top skin in 1-inch-wide strips.

2-410. Inspection. Inspect for nicks, scratches, dents, and small cracks that can be corrected by a simple procedure, such as stop-drilling cracks, removing dents, burnishing nicks and scratches. Damage must clear each bolt, rivet, and radius a minimum of ¾-inch. Check that repairs do not interfere with the opening and closing of the platform.

2-411. Removal. (See fig. 2-97.2.)

a. Unlatch the aft landing gear panel. Secure it in open position with the safety strap for access to the work platform/pod fairing hinge.

b. Disconnect the bonding cables from the pod fairing.

c. Unlatch the gas spring tubes from operating position and latch in the storage clips at the corners of the work platform.

d. Remove the hinge pins and sleeve bushings from the platform hinges.

e. Unlatch and separate the work platform from the pod fairing.

2-412. Repair. Refer to TM 55-1500-204-25/1 for damage classifications of sandwich-honeycomb floor and rigidized skin. See fig. 2-7 for typical repair information on skin. Reapply walkway material to repaired areas. Refer to para 2-626. Numerous isolated damages or damage too extensive to be repaired by patching or insertion necessitates replacement in whole or in part of the platform. Any damage to hinges other than negligible necessitates replacement.

2-413. Installation. (See fig. 2-97.2.)

a. Align and latch the work platform in closed position.

b. Unlatch, open, and secure the panel with its safety strap.

c. Insert the sleeve bushings and hinge pins into the platform hinges.

d. Unlatch the gas spring tubes from the storage clips. Latch them into operating position.

e. Connect the bonding (ground) cables to the pod fairing.

2-414. Window Panes and Framing.

All window panes in the aft fuselage structure assembly are made of stretched acrylic plastic. The panes are retained in the fuselage structure by an aluminum frame, a rubber seal, and a rubber/fabric seal filler. A nylon strap is looped over the seal for jettisoning purposes. The window panes and framing in the aft fuselage structure assembly are identical to those in the cabin fuselage structure assembly.

2-415. Jettisonable Windows.

(Refer to para 2-128.)

2-416. Cleaning. (Refer to para 2-67.)

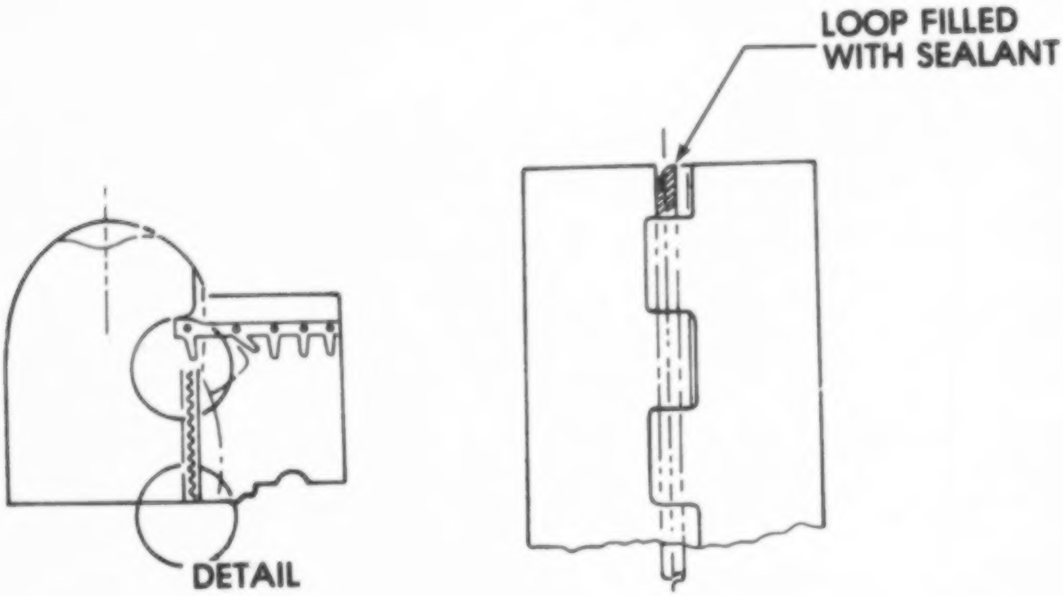


Figure 2.97.3 Hinge Pin Repair

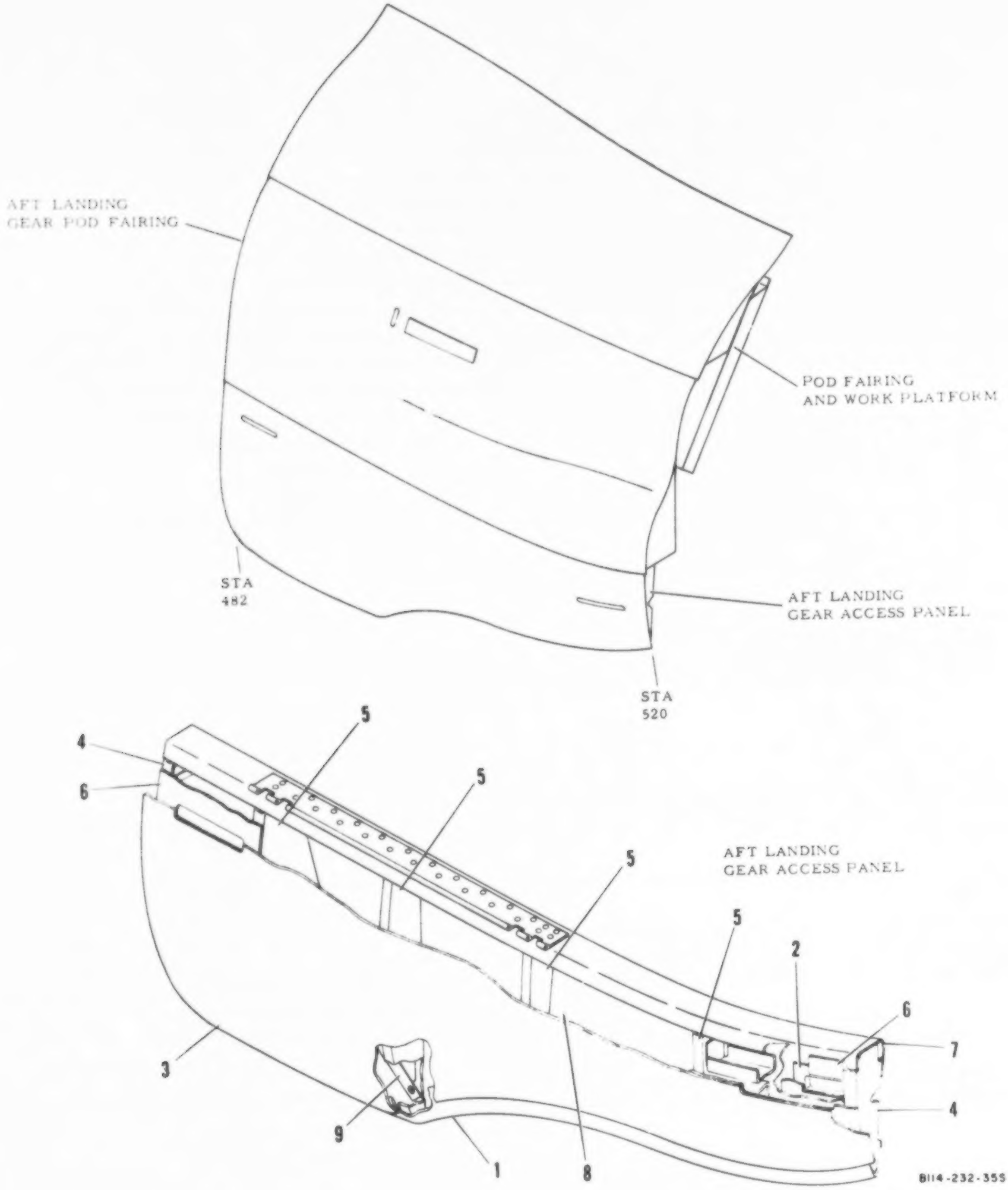

AFT LANDING
GEAR POD FAIRING
POD FAIRING
AND WORK PLATFORM
STA
482
AFT LANDING
GEAR ACCESS PANEL
STA
520
5
4
6
5
5
AFT LANDING
GEAR ACCESS PANEL
5
2
6
7
3
4
9
1
8
BI14-232-355

Figure 2-98. Pod Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 3)

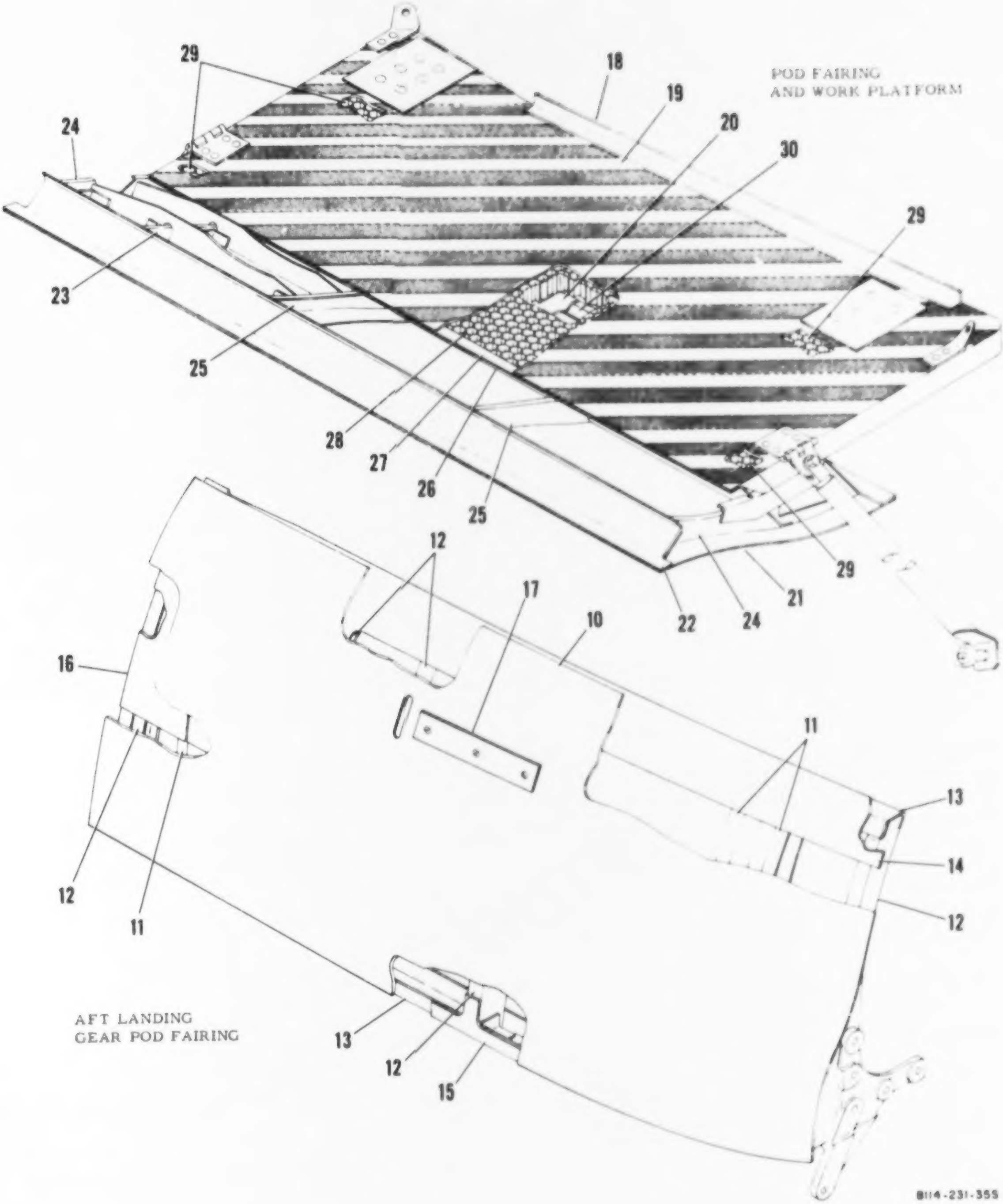

29
18
19
POD FAIRING
AND WORK PLATFORM
24
20
30
29
23
25
28
27
26
25
12
29
17
21
10
22
24
16
11
13
14
12
11
12
AFT LANDING
GEAR POD FAIRING
13
12
15
8114-231-355

Figure 2-98. Pod Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 3)

AFT LANDING GEAR ACCESS PANEL, POD FAIRING AND WORK PLATFORM
AND AFT LANDING GEAR POD FAIRING

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	ANGLE	8-PLY, NO. 181 GLASS CLOTH	NOTE F.	--
2	COVER	3-PLY, NO. 181 GLASS CLOTH	NOTE F.	--
3	SKIN (OUTER)	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
4	FORMER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
5	FORMER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
6	DOUBLER	0.025 2024-T4 CLAD	NOTE B.	--
7	CHANNEL	0.051 2024-T4 CLAD	0.063 2024-T3 CLAD	--
8	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
9	CHAFING STRIP	0.125 PHENOLIC LAMINATE	NOTE D.	--
10	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
11	FORMER	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	--
12	FORMER	0.025 7075-T6 CLAD	0.032 7075-T6 CLAD	--
13	CHANNEL	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	--
14	FINGER PLATE	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
15	FINGER PLATE	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	--
16	DOUBLER	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	--
17	CHAFING STRIP	RIGID POLYAMIDE	NOTE D.	--
18	ANGLE	ALCOA 13637 7075-T6	0.051 4130	--
19	SKIN	0.016 2024-T4 CLAD	0.020 2024-T3 CLAD	2-7
20	SKIN	0.012 7075-T6 CLAD	0.016 2024-T3 CLAD	2-7
21	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
22	STIFFENER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
23	STIFFENER	0.032 2024-T4 CLAD	0.032 2024-T3 CLAD	--
24	STIFFENER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
25	STIFFENER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
26	STIFFENER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
27	EDGE MEMBER	3-PLY SCOTCHPLY	NOTE F.	--
28	CORE	1.222 3.4-1/4-15N 3003	NOTE C.	--
29	CORE	1.222 23.4-1/8-60N 3003	NOTE C.	--
30	STIFFENER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. DAMAGE TO DOUBLERS NECESSITATES REPLACEMENT OF THE DAMAGED PORTION WITH THE SAME MATERIAL AS ORIGINAL
C. REFER TO TM 55-1500-204-25/1 FOR REPAIR OF SANDWICH HONEYCOMB STRUCTURE
D. REPLACE WITH A NEW LENGTH OF ORIGINAL MATERIAL (C248 OR C252) FOR DAMAGE OTHER THAN NEGLIGIBLE
E. APPLY WALKWAY MATERIAL (C377) AS REQUIRED BY WEAR OR REPAIR. REFER TO PARA 2-626
F. REFER TO TM 55-1500-204-25/1 FOR CLASSIFICATION OF DAMAGE AND REPAIR OF IMPREGNATED GLASS CLOTH PARTS

B114-233-345V

42x37

Figure 2-98. Pod Fairing Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 3)

2-417. Inspection. Inspect the aluminum frame for nicks, dents, or scratches which can be removed by burnishing, or small holes which can be filled with a type A rivet. Repairs must not interfere with the removal, installation, or function of the window pane.

2-418. Removal. (Refer to para 2-131.)

2-419. Repair—Refinishing (optical). (Refer to para 2-67.)

2-420. (Deleted.)

2-421. Installation. (Refer to para 2-133.)

2-422. Window Frames.

(Refer to para 2-414.)

2-423. Inspection. (Refer to para 2-417.)

2-424. Repair. (See fig. 2-79.) Extensive damage, such as the loss of more than 25 percent of the frame circumference or numerous isolated repairs, necessitates replacement of the damaged part.

2-425. Equipment Support Structures.

The only support structure required for equipment in the aft fuselage structure assembly is the ramp actuator support.

2-426. Ramp Actuator Support.

The ramp actuator support is located between sta 482 and 502.43, at wl +5.8, on each side of the fuselage. Each support consists of a web made of 2024-T4 clad aluminum alloy containing flanged lightening holes. A cap of extruded 7075-T6 aluminum alloy, Alcoa 78J, is riveted between sta 482 and 502.43. The cap provides support for the web.

2-427. Inspection. See fig. 2-3 for examples of damage to internal webs and fig. 2-10 for examples of damage to the extruded cap.

2-428. Repair. (AVIM). Damage to web affecting less than one-half of web cross section can be repaired by patching. Damage to web affecting more than one-half of a web cross section or extruded cap should be repaired by insertion. Extensive damage, such as loss of a major portion of the length of a member, necessitates replacement of member or entire support.

2-429. Tailcone — Auxiliary Power Unit Enclosure.

See fig. 2-99. The tailcone extends from sta 594 to sta 630 and is riveted to the cargo door coaming. The tailcone is made of formed aluminum alloy skins, lapped and riveted. Internal formers, made of formed aluminum alloy channels maintain the skin shape. A deck, consisting of two outboard webs made of aluminum, formed channels of aluminum alloy, and a duct liner made from three plies of impregnated glass cloth, is located between wl +34 and wl +37. Another deck at wl +72 consists of a web and formed sections made of aluminum alloy. Apu upper mount supports 114S3359-17 and -18 are attached to the deck at wl +72 between sta 606.0 and 612.0. The lateral apu support structure is located between the formers of sta 606.0 and 612.0 at wl +50.873 and 50.152 on the left side of the helicopter. The skin formers are supported by the aft fuselage section crown beam, which is riveted to the deck located between wl +34 and +37.

2-430. Inspection. Inspect for nicks, dents, and scratches which can be removed by burnishing. Cracks which have been stop-drilled, and small round or oval holes, not exceeding the limits shown in fig. 2-6 are permissible provided that they are temporarily covered with a patch. See fig. 2-3 for examples of damage to the formed parts.

2-431. Repair. (See fig. 2-99.)

a. Damage to skins, affecting less than 25 percent of the area of a skin panel, can be repaired by patching. Damage to formed parts not affecting the radius can be repaired by patching.

b. (AVIM). Damage affecting more than 25 percent of the area of a skin panel or which affects boundary members necessitates repair by insertion. Damage to formed parts, which affects a radius necessitates repair by insertion.

c. (AVIM). (See fig. 2-99, sheet 4.) Repair apu upper mount supports as follows:

(1) Line ream holes through plates 114S3359-23 to 0.3783 to 0.3798 inch. Install oversize bushings maintaining 0.250 inch inside diameter and a slip fit of 0.0002 to 0.0012 inch for bushings in plates.

(2) If oversize bushings cannot be used, proceed as follows:

(a) Drill and punch out rivets from outboard side.

(b) Remove oil plates 114S3359-23.

(c) Make two new plates. Use 0.090 inch alclad sheet, 2024 T3 or T4. Use original plates as a pattern for outside diameter and rivet pattern.

(d) Drill rivet holes. Use No. 30 drill.

(e) Center drill plates. Use ¼ inch drill.

(f) Position plates on outboard side of supports 114S3359-17 and -18.

(g) Install rivets MS20426AD4-5 with countersunk head on inboard side of supports.

(h) Buck rivets. Countersink must be flush to inboard surface of supports.

(i) Line ream 0.250 inch diameter holes in plates to 0.3763 +0.0005
-0.0000 inch.

NOTE

> The elongated holes in supports 114S3359-17 and -18 are acceptable without rework.

(j) Install new bushings, 1 each NAS75-4-009 and NAS77-4-10.

d. (AVIM.) (See fig. 2-99, sheet 2.) Repair apu lateral supports at sta 610.0 and bl 36.0 if hole diameter exceeds 0.264 inch as follows:

(1) Drill and remove rivets. Remove clips 114S3921-9 and -10.

(2) Use original clips as patterns and make new clips. Use 0.063 Alclad sheet, 2024 T3 or T4. Bend radius is 0.19 inch.

(3) Pick up rivet pattern from old clips. Drill rivet holes. Use No. 30 drill for holes in plate area and a NO. 21 drill for the holes in the flange areas.

(4) Drill the 0.250 inch diameter holes in the plate areas.

(5) Install new clip 114S3921-9 against the bottom surface of support 114S3921-5, and clip 114S3921-10 on the upper surface of support 114S3921-6. Install rivets MS20426AD4-4 and MS20426AD5-5.

2-432. Cargo Door Coaming.

The cargo coaming is constructed of laminated plastic-impregnated glass cloth molded over formers of aluminum alloy. The coaming is riveted to the aft fuselage section between sta 575.5 and 630.

2-433. Inspection. Inspect for small wrinkles, slight voids, cracks, and small damaged areas that can be corrected by a simple procedure, such as stop-drilling cracks and removing small damaged areas. Temporary patching of cracks and small trimmed holes is permissible.

2-434. Repair.

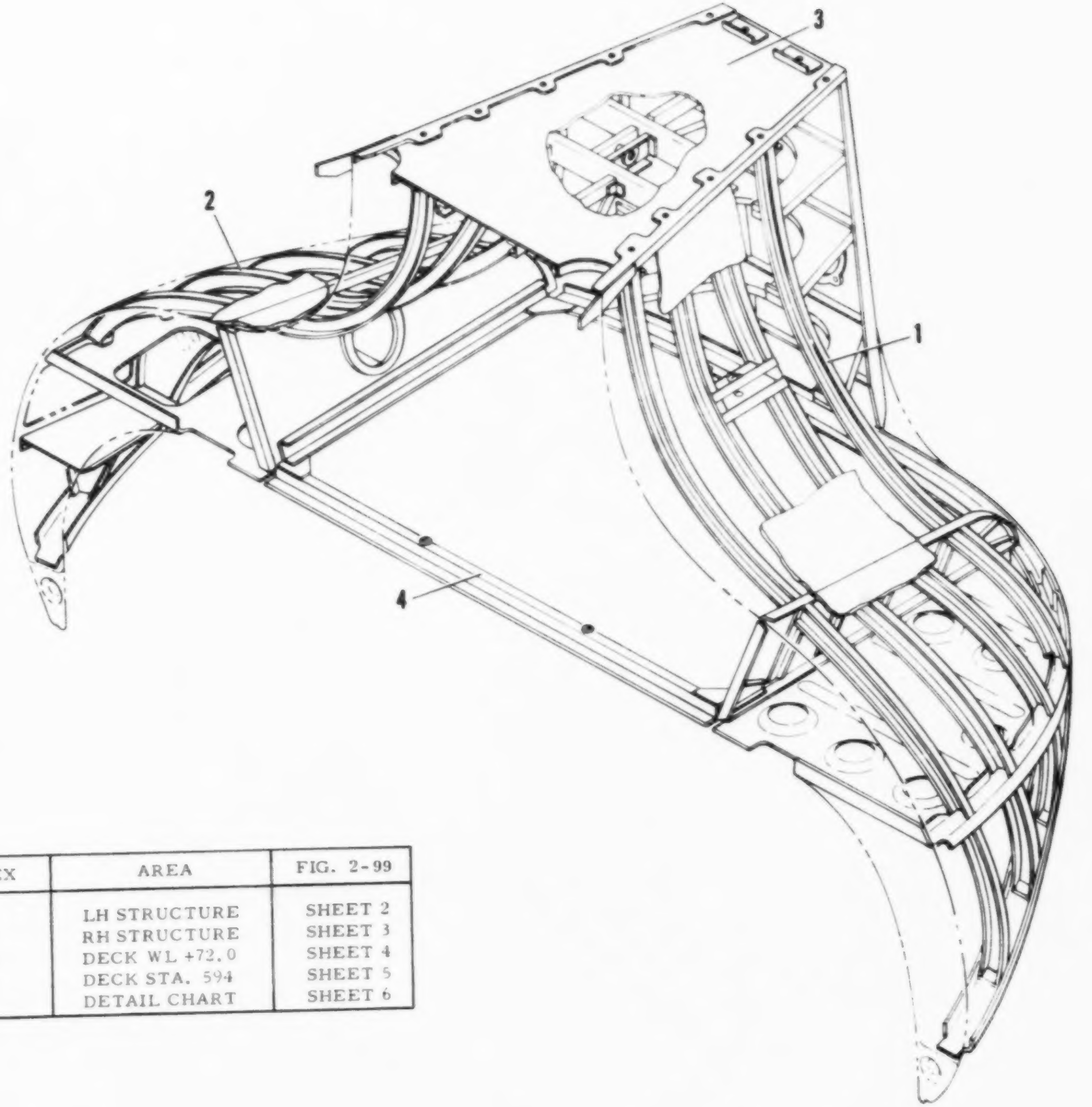
Refer to TM 55-1500-204-25/1 for damage classifications and repairs to impregnated glass cloth parts. Repairs by patching to formers can be made, provided that damage does not exceed one-half the cross section or flange of former.

CAUTION

> If damage is caused by chafing from the cargo loading ramp extension, make sure sufficient clearance is provided upon completion of repair. See fig. 2-12, sheet 1.

2-435. Cargo Ramp Hinge Tunnel.

(See fig. 2-100.) The hinge tunnel consists of a fingerplate of magnesium alloy, a floor panel assembly of sandwich

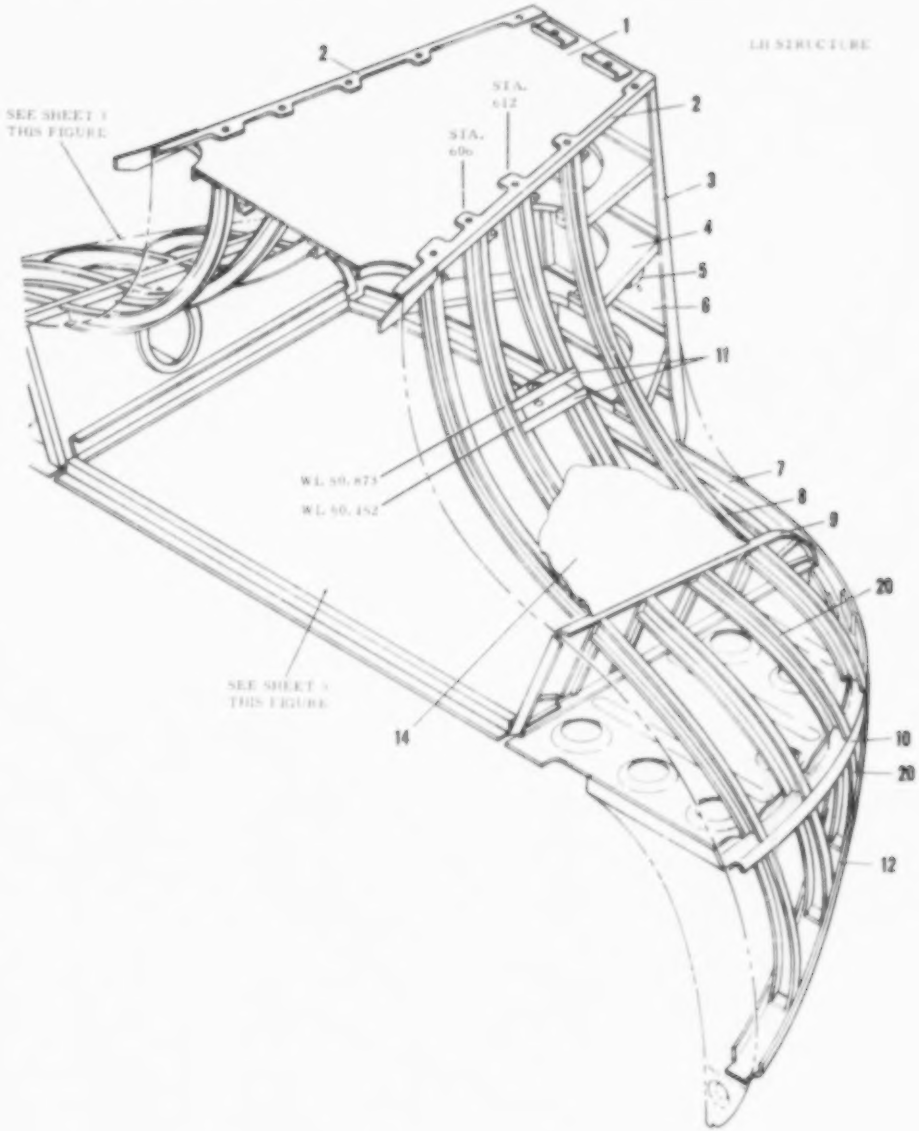


INDEX	AREA	FIG. 2-99
1	LH STRUCTURE	SHEET 2
2	RH STRUCTURE	SHEET 3
3	DECK WL +72.0	SHEET 4
4	DECK STA. 594	SHEET 5
	DETAIL CHART	SHEET 6

B114-578-345V

54x39

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 6)


LH STRUCTURE
1
2
2
3
4
5
6
11
7
8
9
20
10
20
12
14
STA. 612
STA. 606
SEE SHEET 1 THIS FIGURE
WL 50.873
WL 50.152
SEE SHEET 3 THIS FIGURE

54 x 39

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 6)

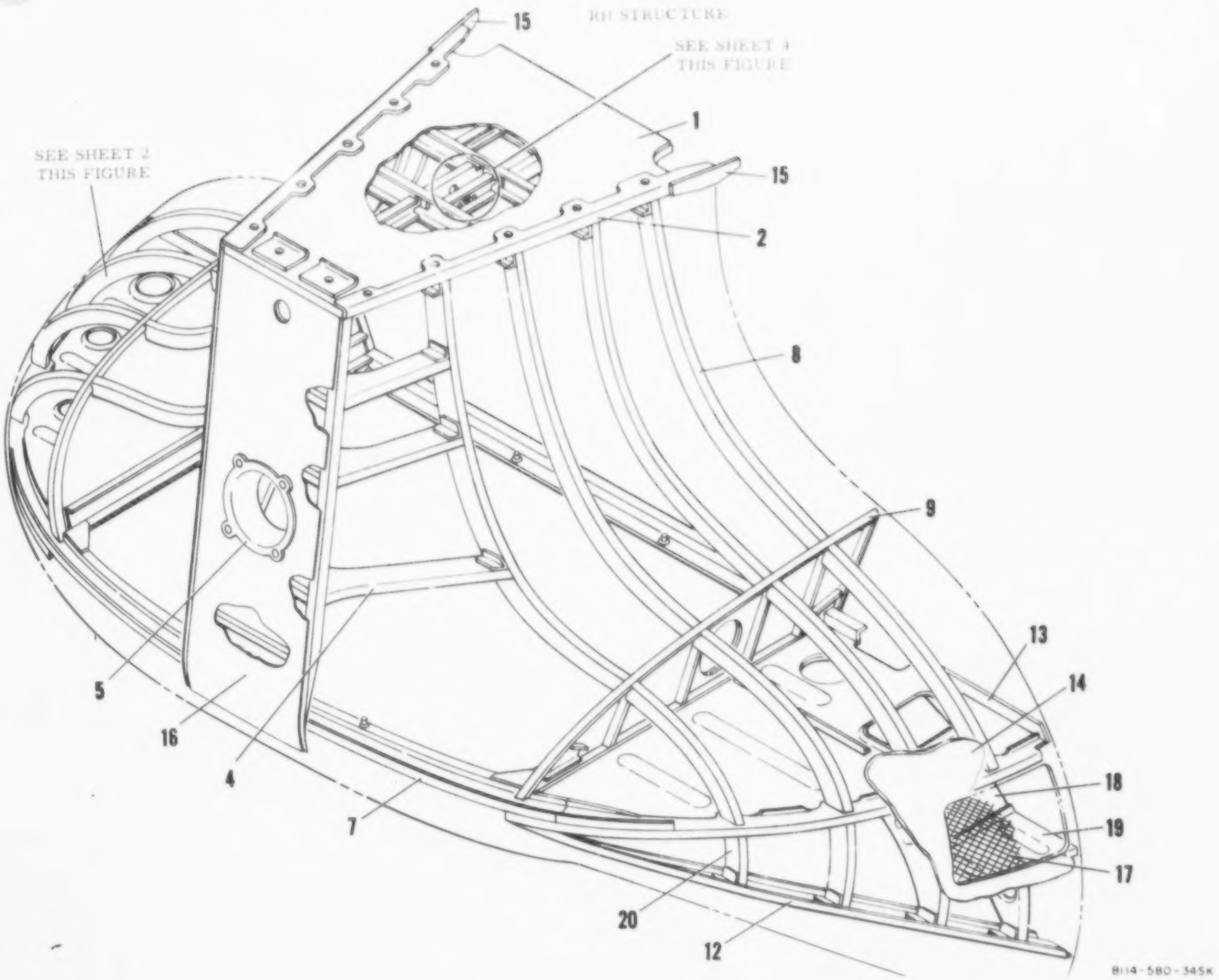
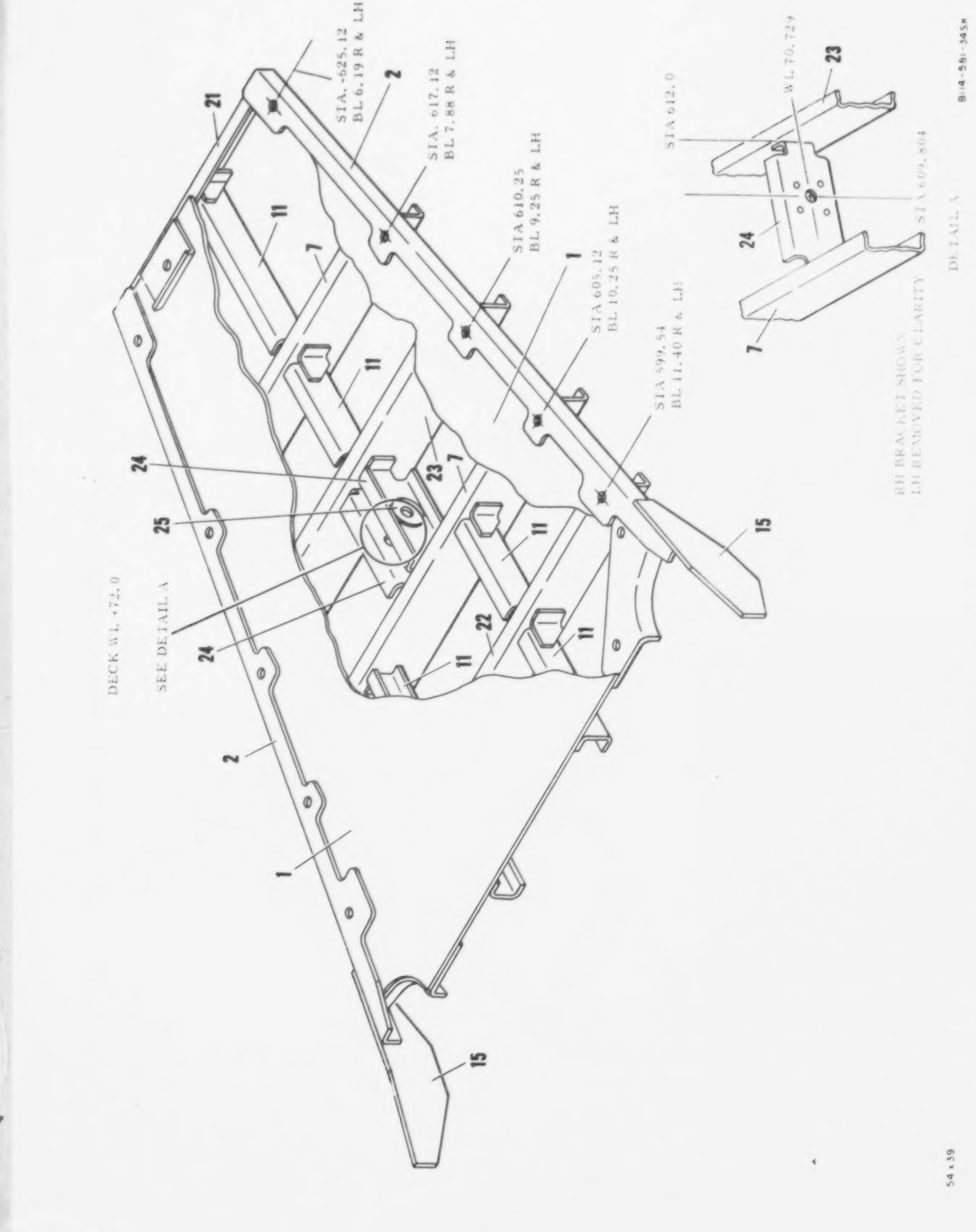

RH STRUCTURE
SEE SHEET 4 THIS FIGURE
SEE SHEET 2 THIS FIGURE
15
1
15
2
8
9
13
14
18
19
17
5
16
4
7
20
12
54x39
B114-580-345K

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 6)



SIA. 625.12
BL 6.19 R & LH
21
2
SIA. 617.12
BL 7.88 R & LH
11
7
SIA 610.25
BL 9.25 R & LH
1
SIA 605.12
BL 10.25 R & LH
11
SIA 599.54
BL 11.40 R & LH
24
23
7
25
DECK WL +72.0
SEE DETAIL A
11
24
22
11
11
15
2
1
15
SIA 612.0
WL 70.729
23
24
SIA 604.804
7
RH BRACKET SHOWN
LH REMOVED FOR CLARITY
DETAIL A
B114-581-345R
54x39

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 4 of 6)

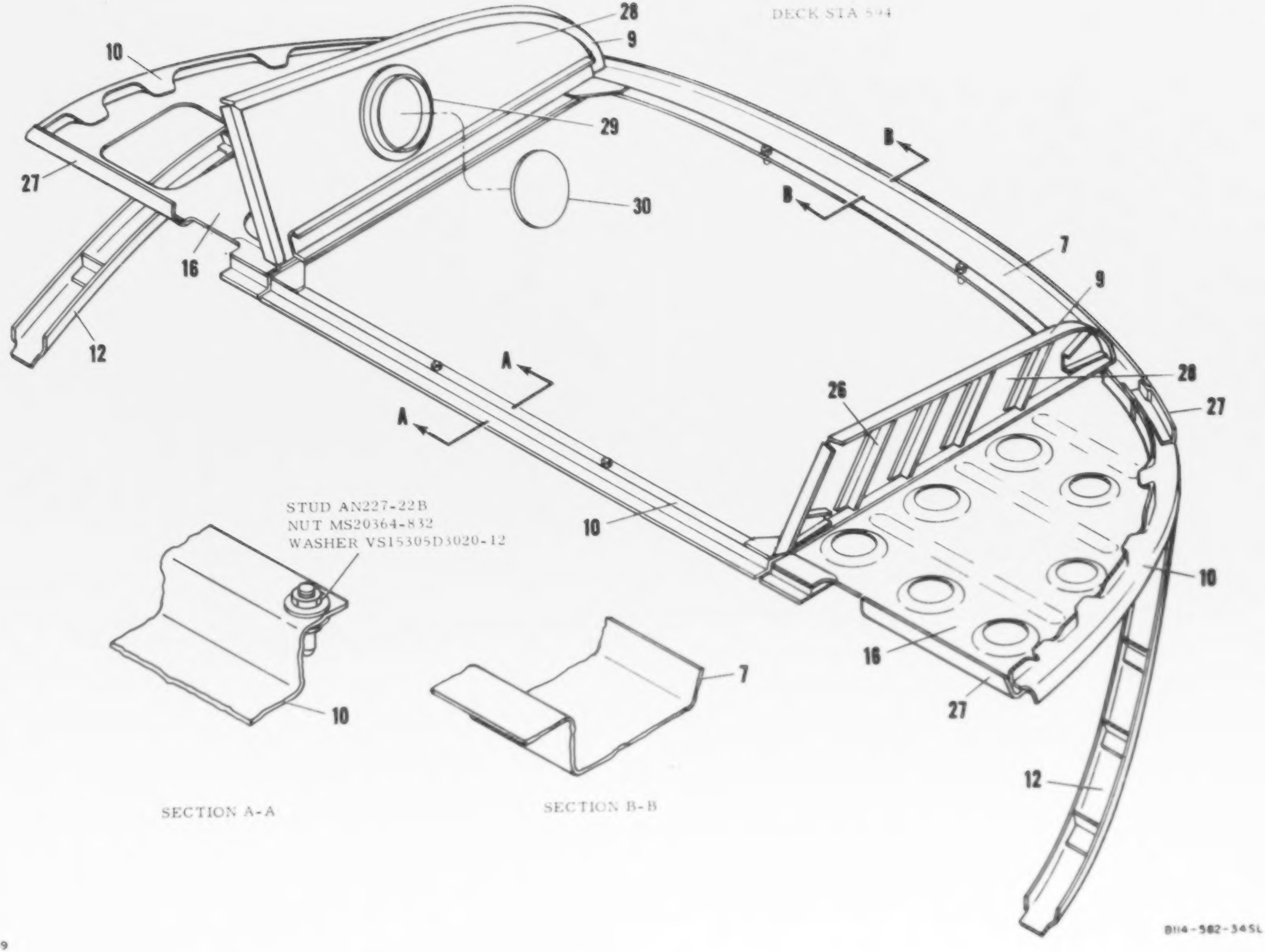

DECK STA 594
28
9
10
29
27
30
B
B
16
7
9
12
A
A
28
26
27
10
STUD AN227-22B
NUT MS20364-832
WASHER VS15305D3020-12
10
16
7
10
27
12
SECTION A-A
SECTION B-B
54x39
B114-582-345L

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 5 of 6)

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD
2	CAP	0.050 7075-T6 CLAD	0.050 7075-T6 CLAD
3	ANGLE	0.050 2024-T6 CLAD	0.050 7075-T6 CLAD
4	FORMER	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
5	EJECTOR ASSY	114P0134-1	NOTE B.
6	DOUBLER	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
7	CHANNEL	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
8	FORMER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
9	CAP	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
10	ZEE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
11	CHANNEL	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
12	LONGERON	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
13	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
14	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD
15	GUSSET	0.063 7075-T6 BARE	0.071 7075-T6 BARE
16	WEB	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD
17	SCREEN	0.040 2024-T4 CLAD	NOTE C.
18	LINER	3 PLY NO 181 GLASS CLOTH	NOTE D.
19	LINER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
20	CHANNEL	0.025 2024-T4 BARE	0.032 2024-T3 CLAD
21	ANGLE	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD
22	CHANNEL	0.025 7075-T6 BARE	0.032 7075-T6 CLAD
23	CHANNEL	0.050 7075-T6 BARE	0.050 7075-T6 CLAD
24	SUPPORT	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD
25	PLATE	0.090 2024-T3 CLAD	NOTE E.
26	STIFFENER	VS70504-27075-T6	0.032 7075-T6 CLAD
27	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD
28	WEB	0.020 2024-T4 CLAD	0.025 2024-T4 CLAD
29	ADAPTER	114P0138-1	NOTE B.
30	PLATE	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD NOTE F

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. FOR DAMAGE OTHER THAN NEGLIGIBLE REPLACE WITH A NEW PART
C. REPAIR IMPRACTICABLE. REPLACE WITH NEW SCREEN 114S3901-23
D. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR REPAIRS TO GLASS CLOTH
E. FABRICATE NEW PART FROM SAME MATERIAL AS ORIGINAL
F. HELICOPTERS 71-20951 AND SUBQ AND FIELD MODIFIED HELICOPTERS

42x44

B114-583-34SV

Figure 2-99. Tailcone Repairs—Aft Fuselage Structure Assembly (Sheet 6 of 6)

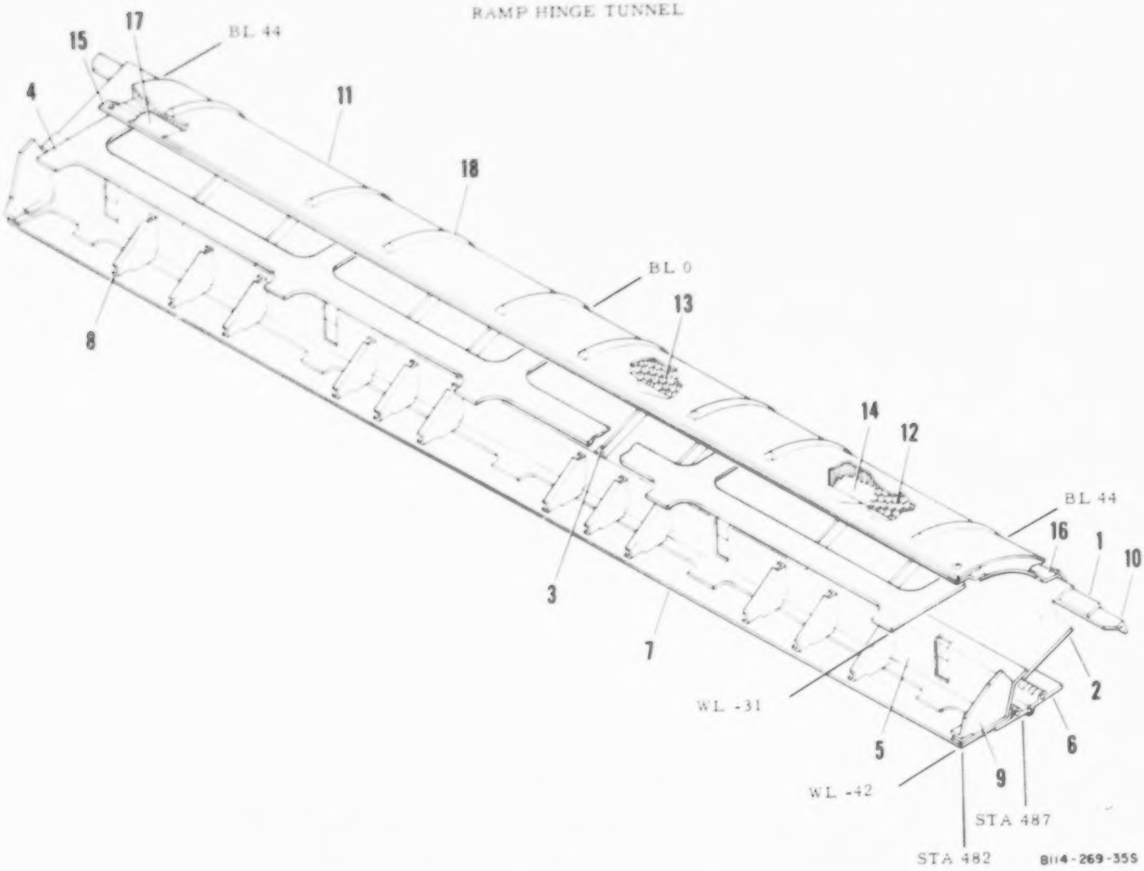


Figure 2-100. Ramp Hinge Tunnel Repairs—Aft Fuselage Structure Assembly (Sheet 1 of 3)

honeycomb construction, two web assemblies, and a double action hinge assembly. It is located between sta 478 and 495 at wl -30 from bl 45 r to bl 45 l. All bottom skin joints and laps are sealed watertight.

2-436. ***Inspection.*** Inspect for damage which can be permitted to exist as is or can be corrected by a simple procedure, such as stop-drilling cracks, burnishing scratches and removing small damaged areas.

2-437. ***Repair.*** (See fig. 2-100.)

a. Small holes must not exceed limits shown in fig. 2-6, and must either be filled with a type A rivet or covered temporarily with a patch. Refer to para 2-583 for damage classifications for extruded parts. Refer to para 2-646 for information concerning typical repair to skin and webs. External repairs must be sealed watertight. (Refer to para 2-554.) Where required, apply non-skid paint (C230) to the repaired areas. Refer to para 2-627.

b. (AVIM). Damage exceeding the limits shown in fig. 2-6 must be repaired by insertion. Damage affecting more than one-half the cross section at the formed part or skin area between formers can be repaired by insertion.

2-438. Cargo Loading Ramp Installation.

(See fig. 2-101.) The cargo loading ramp installation consists of a cargo loading ramp assembly, a cargo door assembly (5), two ramp hydraulic actuating cylinders (1), three removable floor panels (3), three cargo loading auxiliary ramps (9), two cargo door supports (4), and a cargo door mechanism. The ramp assembly is hinged to the fuselage at the floor line at sta 487. It is raised and lowered by the cylinders. The ramp assembly is all-metal construction with formers and beams. The cargo door retracts inside the ramp. Mounted on the ramp assembly is a cargo door operating mechanism. The ramp assembly has three removable floor panels. Three cargo loading auxiliary ramps bridge the distance from the ramp edge to the ground. Watertight flotation sealing must be maintained at wl 0 and below. Weathertight sealing is required above wl 0. Refer to para 2-554 for fuselage sealing requirements.

NOTE

On helicopters with MWO 55-1500-204-30-1, a locking device is installed on the cargo ramp control access door latch mechanism.

2-439. ***Operation.*** The cargo ramp is raised by hydraulic pressure and lowered by hydraulically releasing the actuator uplocks and allowing the ramp to descend. The lowering operation is controlled by the hydraulic fluid which is displaced from the lower part of the actuator and circulated to the upper part. The cargo door is retracted into the

RAMP HINGE TUNNEL

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	ALCOA 61971 7075-T6	0.050 4130	--
2	WEB	0.020 7075-T6 CLAD	0.025 7075-T6 CLAD	2-7
3	STIFFENER	ALCOA 28546 7075-T6	0.036 4130	--
4	FINGERPLATE	0.040 AZ31B-H24 MAG ALY	0.050 4130	2-7
5	WEB	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
6	HINGE ASSEMBLY	MS20001-PH9	NOTE B.	--
7	SKIN	0.032 7075-T6 CLAD	0.040 7075-T6 CLAD	2-7
8	BRACKET	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
9	CAP	4 PLY-LAMINATED GLASS CLOTH	NOTE C.	--
10	SPLICE ANGLE	HARVEY 11301-3 7075-T6	0.125 4130	--
11	SKIN	0.016 CRES 301 HD	NOTE D.	--
12	CORE	0.952 4.3-1/4-20N 3003	NOTE D.	--
13	CORE	0.952 3.3-1/4-15N 3003	NOTE D.	--
14	SKIN	0.016 7075-T6 BARE	NOTE D.	--
15	EDGE MEMBER	0.063 7075-T6 BARE	NOTE D.	--
16	EDGE MEMBER	0.040 7075-T6 BARE	NOTE D.	--
17	DOUBLER	0.020 7075-T6 BARE	NOTE D.	--
18	SKID RAIL	ALCOA 1263 2024-T4	NOTE C.	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REPAIR BY INSERTION, USE SAME MATERIAL AS ORIGINAL HINGE HALF, MAKE FROM MS20001-PH9 OR MS20001-PX9 AS REQUIRED. HINGE PIN, MAKE FROM MS20253-P2

C. REPLACE WITH ORIGINAL PART

D. COMPONENT OF SANDWICH HONEYCOMB STRUCTURE. REPAIR USING SAME TYPE MATERIAL AS ORIGINAL. REFER TO TM 55-1500-204-25/1

42x35

B114 270 345V

Figure 2-100. Ramp Hinge Tunnel Repairs—Aft Fuselage Structure Assembly (Sheet 2 of 3)

ramp when the ramp is lowered. The door is extended when the ramp is raised. The door action is controlled by a hydraulic sequence valve which is actuated by the ramp. A hydraulically actuated valve stops the ramp and holds it stationary while the door retracts or extends. (Refer to para 7-394.) To operate the ramp, proceed as follows:

a. Make sure that the area beneath the ramp is unobstructed.

CAUTION

If any hydraulic lines have been disturbed, the hydraulic system must be bled before the ramp is operated. (Refer to para 7-220.)

b. Connect a hydraulic teststand to the utility system ground test connections. (Refer to para 1-99.)

c. Adjust the teststand to deliver 3 gpm at 3,000 psi pressure.

d. Operate the ramp control lever to UP. When the ramp is approximately 8 inches from the fully closed position, it will stop and the door will extend. After the door has extended, the ramp will continue upward and lock in the closed position.

e. Operate the ramp control lever to DN. When the ramp is open approximately 10 inches, it will stop and the door will retract. After the door has retracted, the ramp will continue downward.

f. If necessary, stop the ramp at any intermediate position between up and down by operating the ramp control lever to STOP.

2-440. Cargo Loading Ramp.

The cargo loading ramp assembly consists of aluminum alloy skin, formers, beams, and flooring.

2-441. Securing an Inoperative Ramp. (See fig. 2-102.) This procedure is for securing a ramp to hold it off the ground when a helicopter must be moved with an inoperative ramp hydraulic system.

WARNING

This procedure is to be used in emergencies only. Any deviation from this procedure could result in damage to the helicopter or injury to personnel.

a. Disconnect the oil line on the left side of the transmission that goes to the oil pressure transducer. Use a container to catch any oil spillage. Cap the line. Remove the fitting from the transmission. Plug the hole in the transmission.

b. Pass a cargo tie-down strap thin hook end over the aft transmission left forward mounting lug. Attach the strap assembly ratchet hook end and opposite thin hook end to the tie-down ring on the left side of the ramp floor.

c. Disconnect the aft transmission lubrication inlet line on the right side of the transmission. Remove the lube fitting from the transmission. Plug the hole. Cap the lube line. Use a container to catch any oil spillage.

d. Pass a cargo tie-down thin hook end over the aft transmission right forward mounting lug. Attach strap assembly ratchet hook end and opposite thin hook end to tie-down ring on the right side of ramp floor.

e. Lift the ramp by hand or by any suitable mechanical device. At the same time take up the slack in both strap assemblies.

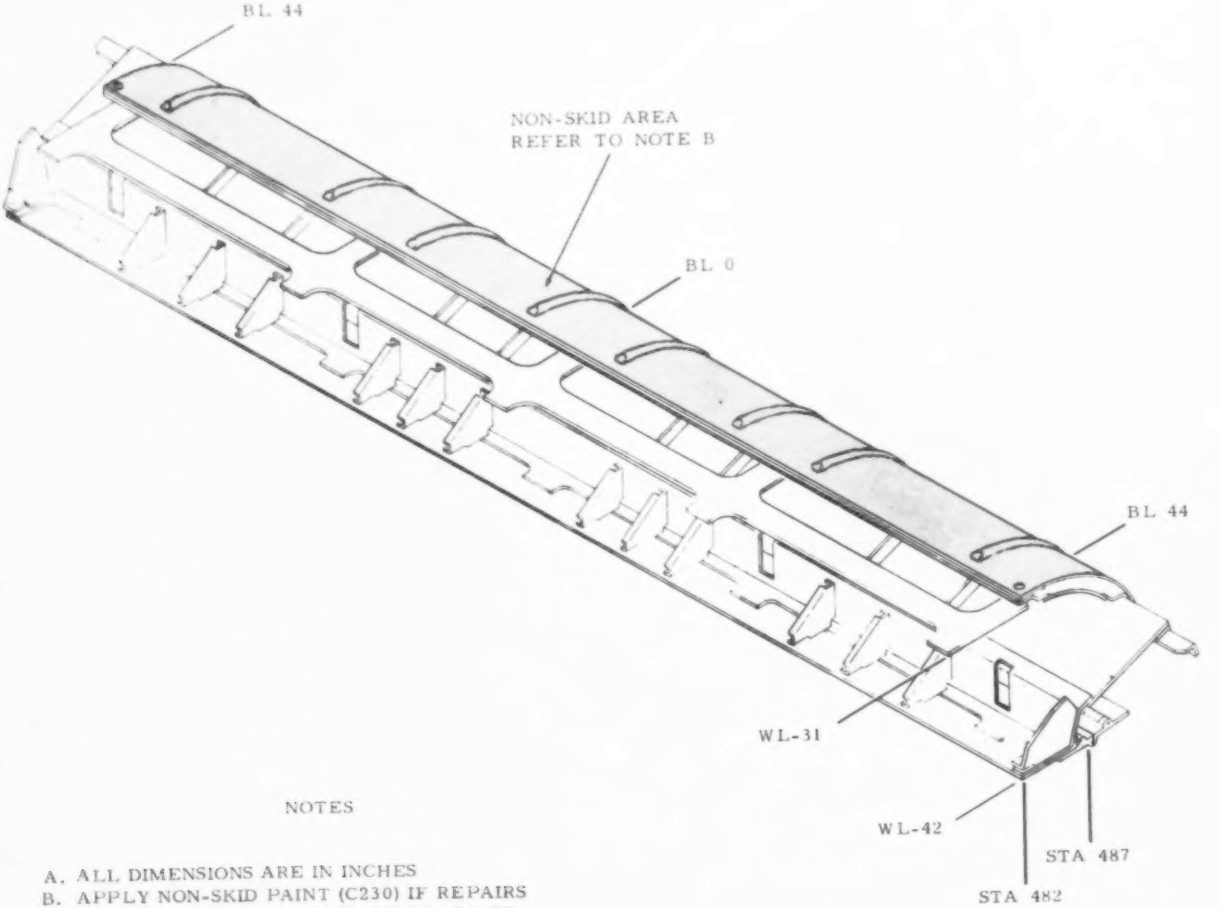
f. Make certain the straps are not against tubing or lines and that the ramp is securely held.

g. After the helicopter is moved, slowly lower ramp by hand or with use of suitable mechanical device. Unfasten the tie-down straps and remove them from the helicopter. Reinstall both fittings into the transmission and reconnect both oil lines.

2-442. Inspection. (See fig. 2-101.) Inspect for the following conditions:

a. Seal deterioration, dents, cracks, corrosion, distortion.

RAMP HINGE TUNNEL--APPLICATION OF NON-SKID PAINT



NOTES

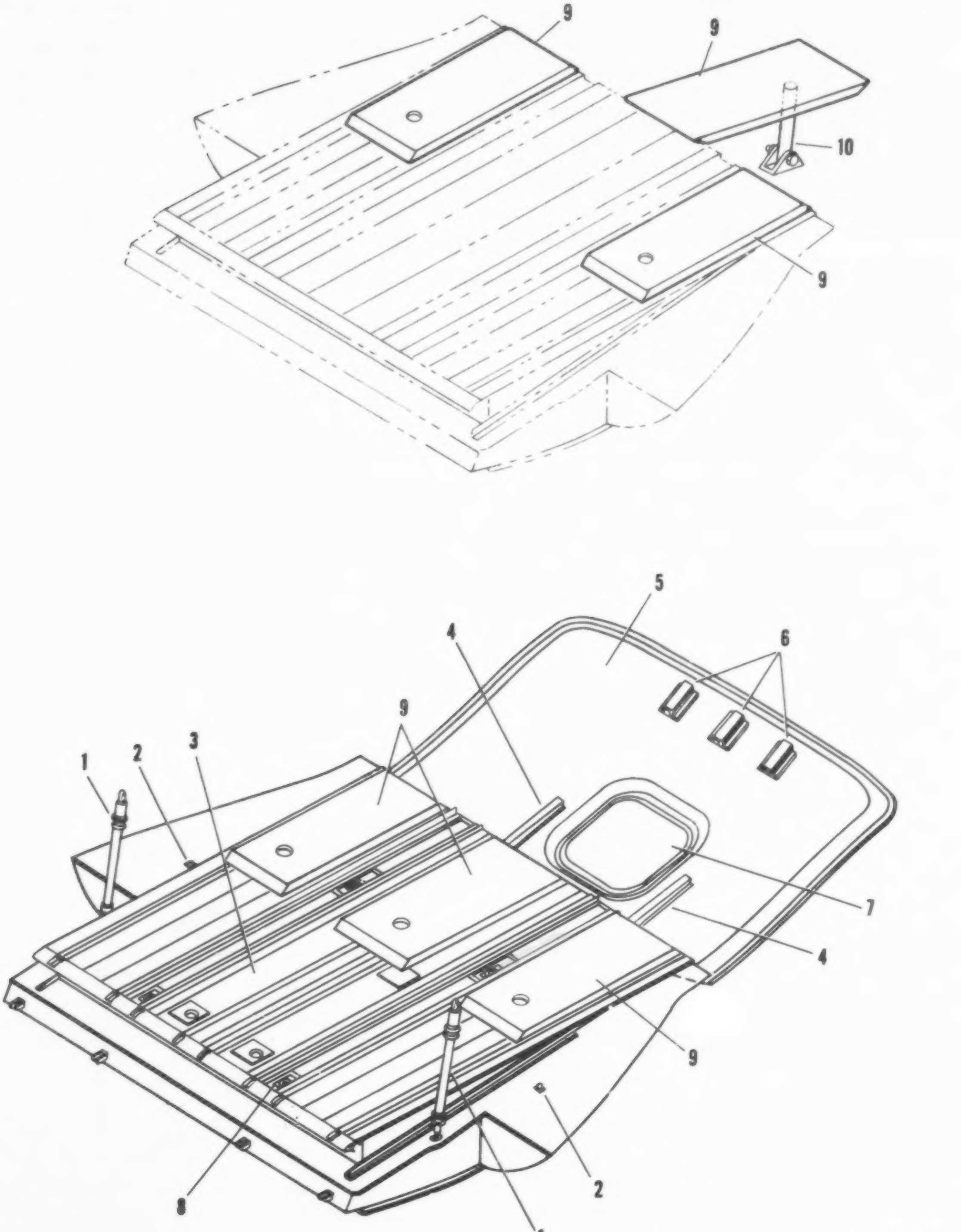
A. ALL DIMENSIONS ARE IN INCHES

B. APPLY NON-SKID PAINT (C230) IF REPAIRS ARE MADE WITHIN THE SHADED AREA OR IF EXISTING COATING IS WORN

42x36

B114 301 34SV

Figure 2-100. Ramp Hinge Tunnel Repairs—Aft Fuselage Structure Assembly (Sheet 3 of 3)


9
9
10
9
5
4
6
9
1
2
3
7
4
9
8
2
1
42 X 51
B114-292-200

1. Ramp actuating cylinder
2. Shearpin
3. Removable floor panel
4. Support
5. Cargo door
6. Spacers
7. Escape hatch
8. 5,000-pound-capacity tie-down adapter
9. Auxiliary ramp
10. Auxiliary ramp support

Figure 2-101. Cargo Loading Ramp and Door

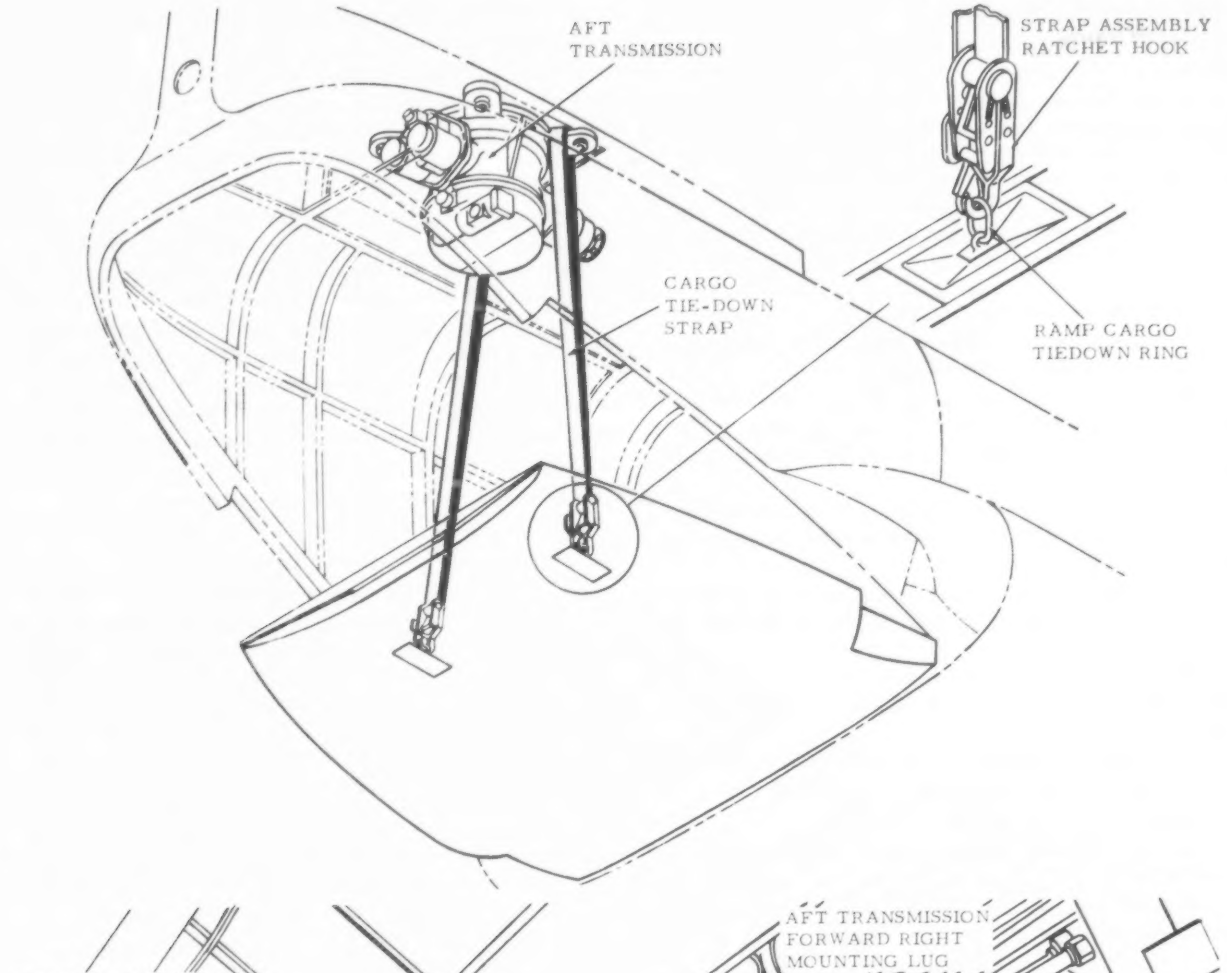

AFT TRANSMISSION
STRAP ASSEMBLY RATCHET HOOK
CARGO TIE-DOWN STRAP
RAMP CARGO TIEDOWN RING
AFT TRANSMISSION FORWARD LEFT MOUNTING LUG
DISCONNECT AND CAP OIL LINE
REMOVE FITTING AND PLUG HOLE
FORWARD
42x54
AFT TRANSMISSION FORWARD RIGHT MOUNTING LUG
REMOVE FITTING AND PLUG HOLE
DISCONNECT AND CAP OIL LINE
FORWARD
B114-971-20L

Figure 2-102. Securing Inoperable Ramp

b. Proper closure, manually.

c. Flooring for cracks, damage, and security of hardware.

d. Check that the depth of nicks and scratches in aluminum alloy panels do not exceed 10 percent of the thickness of the material after burnishing. Holes and cracks must not exceed limits shown in fig. 2-6, and should be temporarily covered with a patch. Cracks must be stop-drilled. All damage must clear bolts, rivets, and radii a minimum of ¾ inch.

2-443. Removal. (See fig. 2-103.)

a. Lower the ramp completely. Support it at the forward end to relieve the load on the hinges.

b. Remove the auxiliary ramps (9, fig. 2-101) by sliding them to the left or right so that the hinge of the auxiliary ramps can be pushed up and out of the hinge of the cargo ramp.

c. Make sure that the cargo loading ramp control lever (1, fig. 7-114) is at STOP. Set the manual control valve to FILLING. (See fig. 7-85.)

d. Disconnect the three ramp hydraulic lines (17, fig. 2-103) at the ramp. Cap the fittings on the ramp. Plug the lines.

e. Remove the bolts (1), washers (2), packings (3) which connect the actuating cylinders (4) to the cargo loading ramp.

f. Disconnect the bonding wire (8) from both sides of the ramp by removing screws (7) and washers (6).

g. Remove the hinge pin (9).

h. Remove the four bolts (14), nuts (12), washers (13) from the fittings (15).

i. Remove the ramp (16) from the helicopter. Place the ramp on a suitable support.

2-444. Repair. (See fig. 2-12.)

a. Damage exceeding negligible limits, but not affecting more than 25 percent of the area of the skin between boundary members after prerepair steps, can be repaired as shown in fig. 2-7. External repairs must be sealed watertight. (Refer to para 2-554.)

Damage which exceeds the negligible limits, but does not affect more than one-half the cross section of a web, can be repaired by patching.

b. (AVIM). Damage exceeding 25 percent of the area of the skin between boundary members, but not affecting the entire skin panel can be repaired by insertion. See fig. 2-7 for typical repairs of this type. Damage affecting more than one-half the cross section of a web should be repaired by insertion. See fig. 2-7 for typical repairs to the webs.

2-445. Installation. (See fig. 2-103.)

a. Make sure the bushings in the fittings (15) of the ramp and the fuselage are in position and serviceable. Reposition or replace them as necessary.

b. Position the ramp (16) to the aft end of the fuselage. Align the holes in the fittings (15) of the ramp and fuselage.

c. Insert the bolts (14) into the fittings. Secure the bolts with the nuts (12) and washers (13) (one under each nut).

d. Insert the hinge pin (9) thru the ramp and fuselage hinges (10 and 11).

e. Connect each actuating cylinder (4) to the ramp fitting (5) with a bolt (1), a washer (2) under the bolt head, and a packing (3) under the washer.

f. Connect the bonding wire (8) to both sides of the ramp.

g. Remove the caps from the three fittings for the ramp hydraulic lines (17). Remove the plugs from the hydraulic lines on the ramp. Connect the lines on the ramp to the fittings. Bleed the lines. (Refer to para 7-220.)

h. Install the auxiliary ramps (9, fig. 2-101) by mating the slots in the auxiliary ramp hinges with the slots in the cargo ramp hinge. Complete the operation by sliding the auxiliary ramps to the left or right approximately 1 inch.

i. Adjust the sequence valve actuating rod. (See fig. 7-103.)

j. Check the operation of the cargo loading ramp and cargo door. (Refer to para 2-439.)

2-446. Cargo Loading Ramp Floor.

(See fig. 2-101.) Three floor panels and two longitudinal beams make up each ramp floor. Two access panels are installed in the forward end of the center panel. One access panel is installed at ramp sta 60. On code H.4, I, and J the longitudinal beams are magnesium. Each beam has two 5,000-pound cargo tiedown adapters (12). On code K and subq and helicopters that have been modified with aluminum beams, the 5,000-pound cargo tiedown adapters (12) are located in the outboard floor panels at bl 38. The sections are made of extruded magnesium alloy panel assemblies riveted together in the same manner as the cabin fuselage section flooring. Walkway material is applied to the floor panels to provide a nonskid surface.

2-447. Inspection. Inspect for the following conditions:

a. Flooring for cracks, damage, and security of hardware.

b. Tiedown adapters for security.

c. Nicks, dents, and scratches which can be removed by burnishing. Holes not to exceed ¼-inch diameter and can be plugged with type B rivets. Repairs must clear each bolt, rivet, and radius a minimum of ¾ inch and shall not restrict operation or use of ramp.

2-448. Removal. (See fig. 2-101.)

a. Lower the ramp until the ramp rests on the ground. (Refer to para 2-439.)

b. Unfold the auxiliary ramps (9).

c. Remove the bolts and washers from around the edges of each floor panel. On helicopters with aluminum longi-

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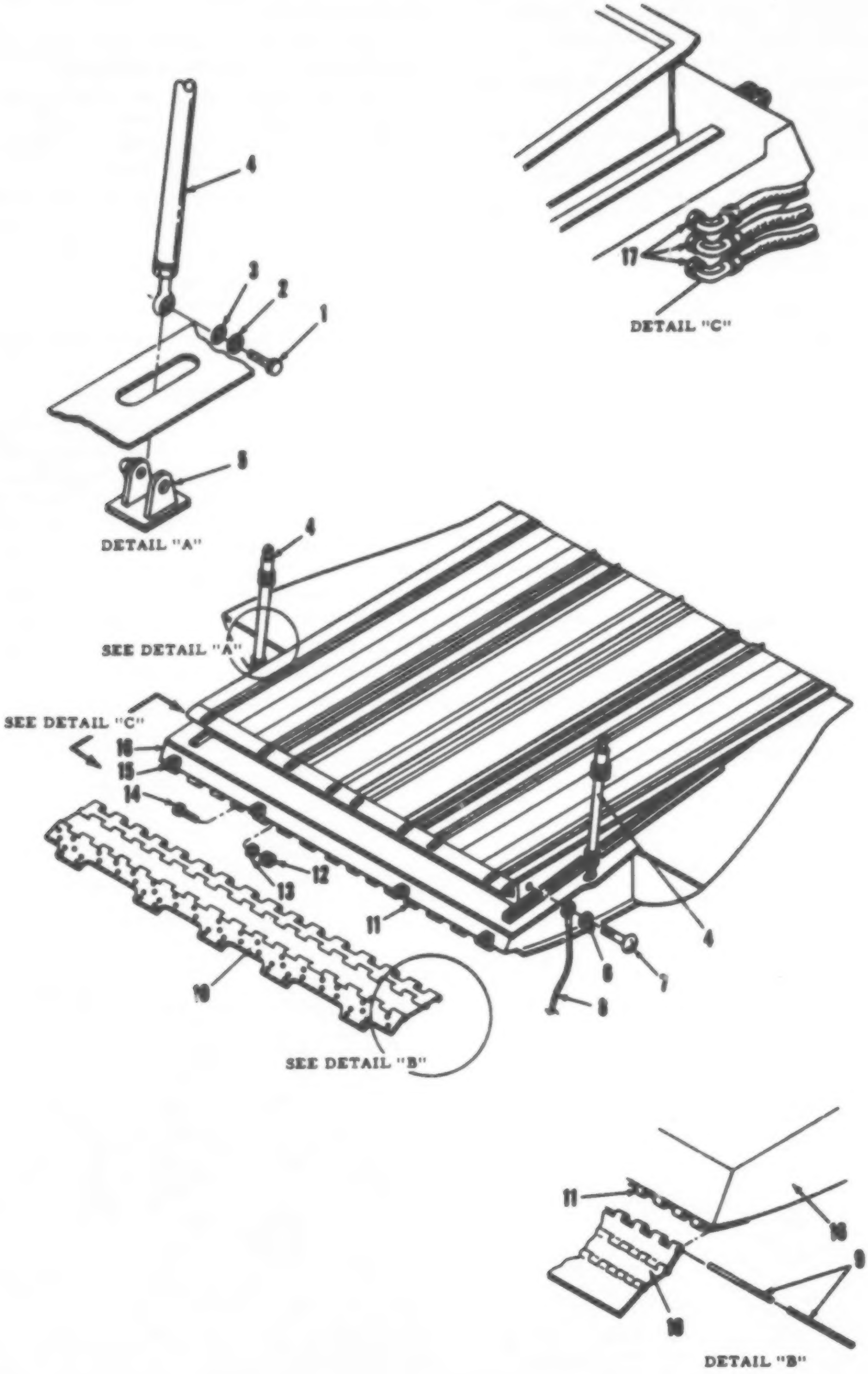
Legend for figure 2-103

1. Bolt
2. Washer
3. Packing
4. Ramp actuating cylinder
5. Lower attach fitting
6. Washer
7. Screw
8. Bonding wire
9. Hinge pin
10. Fuselage hinge half
11. Ramp hinge half
12. Nut
13. Washer
14. Bolt
15. Fitting
16. Ramp
17. Ramp hydraulic lines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SEE DETAIL "B"
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9
10
DETAIL "B"

42x34

Figure 2-103. Cargo Loading Ramp Replacement

tudinal floor beams remove the four screws at each cargo tiedown adapter (12).

d. Lift the forward end of one floor panel from the ramp. Move the floor panel forward and remove it. Remove the other floor panels in the same manner.

2-449. Replacement of Ramp 5,000-Pound Cargo Tiedown Adapters. (See fig. 2-101.)

a. Replace the tiedown adapters (8) on helicopters with the adapters in the longitudinal beams at butt line 20 as follows:

(1) (See fig. 2-104.) Remove the four screws (1) and the adapter assembly from the beam.

(2) Remove the bushing (4) and the ring assembly (2) from the plate (3).

(3) Replace the defective parts.

(4) Assemble the ring assembly (2), bushing (4), and plate (3). Coat the threads of the bushing (4) with sealing compound (C291).

(5) Install the adapter assembly on the beam with the four screws (1). Install the screws wet with zinc chromate primer (C259).

b. Replace the tiedown adapters (8, fig. 2-101) on helicopters with the adapters in the outboard floor panels at bl 38, as follows:

(1) Remove the applicable floor panel. (Refer to para 2-448.)

(2) (See fig. 2-104) Remove the bushing (6) from the ring assembly (5).

(3) Assemble the ring assembly (5) and the bushing (6) on the floor panel. Coat the threads of the bushing (6) with sealing compound (C291).

(4) Install the floor panel. (Refer to para 2-450.)

2-450. Installation. (See fig. 2-101.)

a. Check the floor panel faying surface seal for damage or loss of sealing qualities. Have the seal repaired or replaced if necessary.

b. Place the aft end of the floor panel on the ramp, slightly forward of the aft end of the ramp.

c. Lift the forward end of the panel slightly and move the panel aft. Allow the aft end of the panel to fit into the fitting on the aft ramp beam. Make sure that the top of the floor panel end is on top of the beam.

d. Lower the forward end of the floor panel and install the bolts and washers. (Refer to para 2-339.)

e. Raise the ramp. (Refer to para 2-439.)

2-451. Cargo Loading Ramp Actuating Cylinders.

Refer to chapter 7, Hydraulic and Pneumatic System, see fig. 7-114.

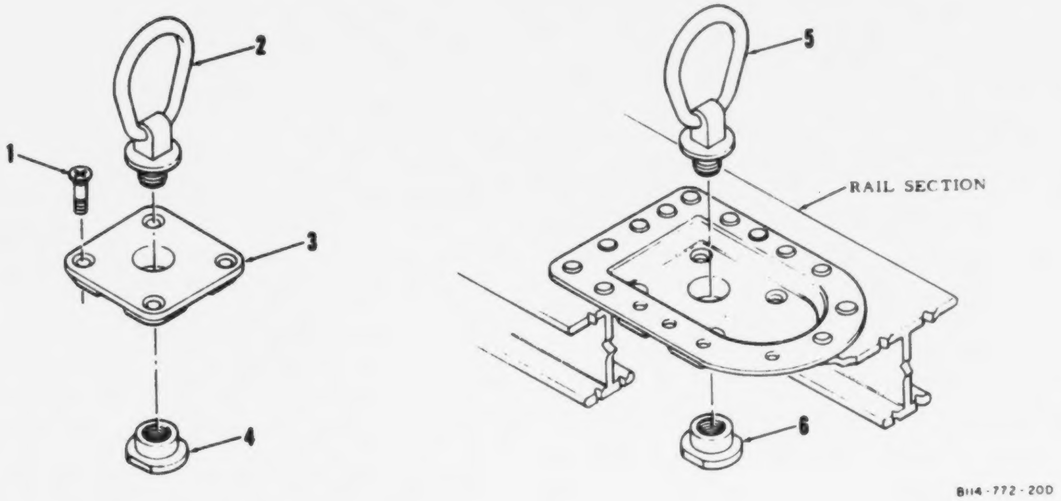
2-452. Cargo Loading Auxiliary Ramp.

(See fig. 2-101.) Each of the helicopters three cargo loading auxiliary ramps consists of a hinge assembly and structural member. The auxiliary ramps are hinged to the aft former of the ramp. When not in use, they are hinged forward and stored on the top surface of the ramp. The auxiliary ramp structural member has a hole on the bottom side. This hole receives a foot type support assembly (3, fig. 2-105) enabling any auxiliary ramp to be used as a work platform. The support assembly is not an integral part of the ramp.

2-453. Inspection of Cargo Loading Auxiliary Ramp. Inspect for the following conditions:

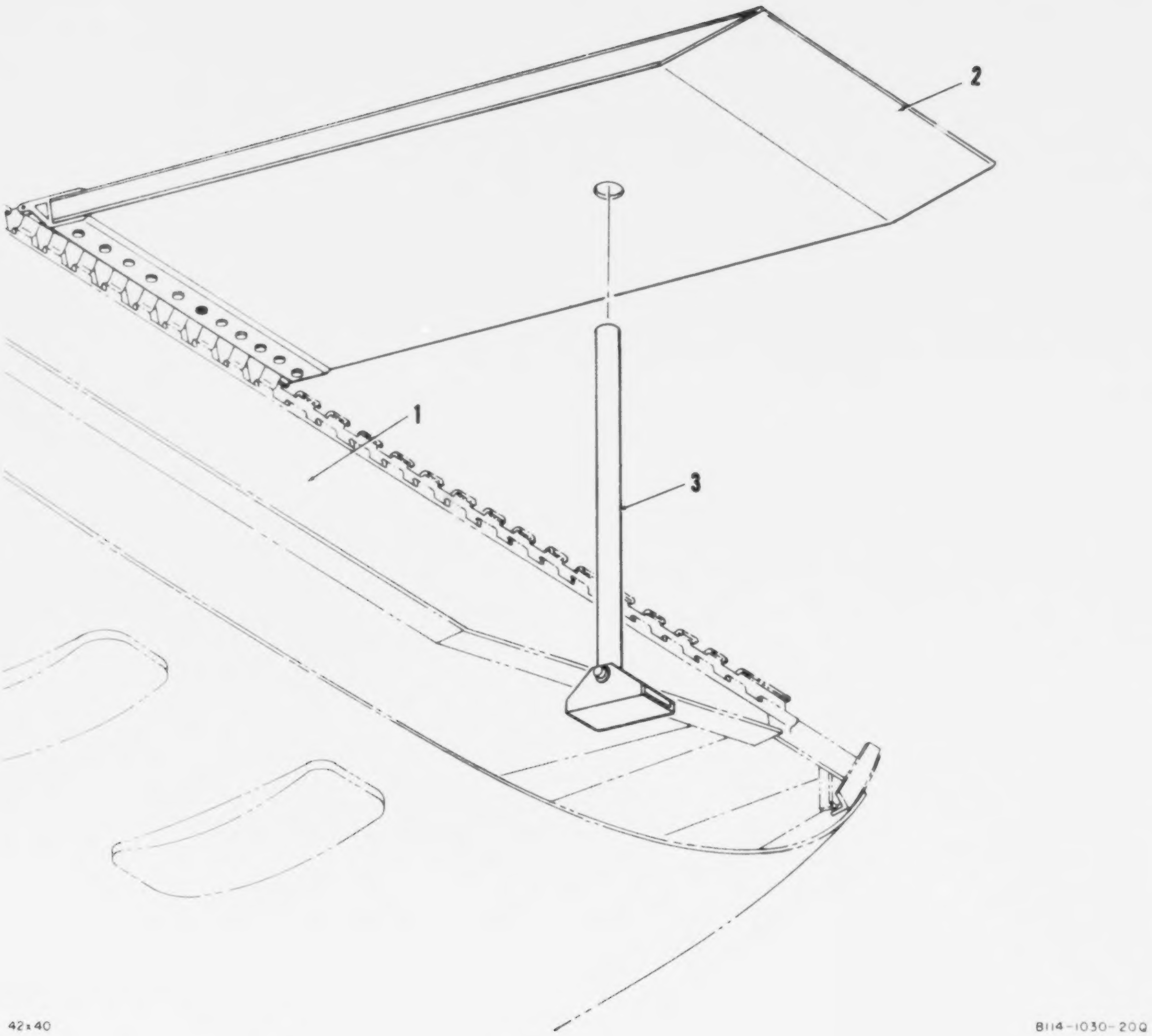
a. Distortion, cracks and security.

b. Attachment brackets, braces and attaching hardware for security.



1. Screw
2. Ring assembly
3. Plate
4. Bushing
5. Ring assembly
6. Bushing

Figure 2-104. Replacement of Ramp 5,000 Pound Cargo Tiedown Adapters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42x40
8114-1030-200

1. Ramp
2. Auxiliary ramp
3. Support assembly

Figure 2-105. Auxiliary Ramp Work Platform, Support Assembly Installation

best copy available

2-454. Repair. Damage exceeding negligible limits can be repaired as shown in fig. 2-12. Refer to TM 55-1500-204-25/1 for damage classification for extruded parts. Refer to TM 55-1500-204-25/1 for typical repairs to sandwich honeycomb structures. If necessary, apply walkway material.

2-455. Replacement of the Auxiliary Ramp Hinge Half. (See fig. 2-106.)

a. Remove the hinge pin (1) and the hinge half (2).

b. Position the replacement hinge half (2) on the structural member hinge (3). Secure the hinge half with the hinge pin (1).

c. Point stake the ends of the hinge to secure the hinge pin.

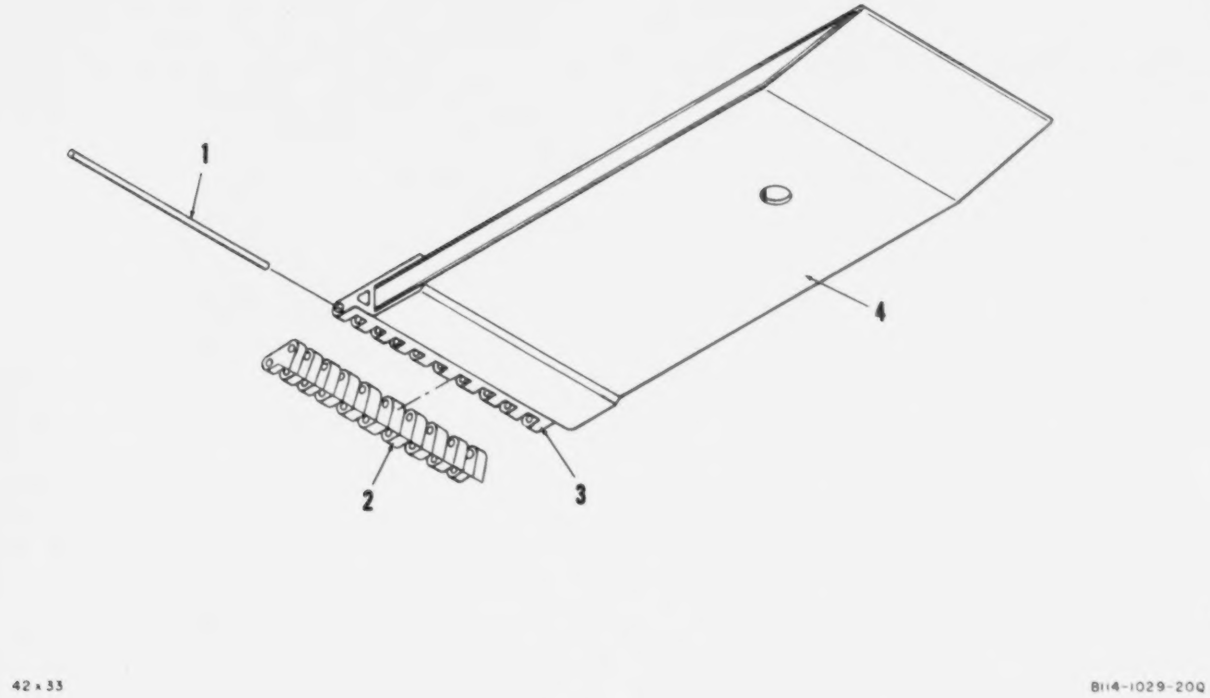
2-456. Installation of Auxiliary Ramp. Refer to para 2-445.

2-457. Jettisonable Cargo Door.

(See fig. 2-107.) For operating purposes, the cargo door is a functional part of the cargo loading ramp. The door is moved by means of a hydraulic actuator, a cable and chain assembly, and pulleys. When the cargo load ramp is being lowered, it stops about 8 inches from the fully closed posi-

Legend for figure 2-107

1. Trolley assembly
2. Cotter pin
3. Nut
4. Washer
5. Bolt
6. Attach bracket
7. Support bracket
8. Actuator link
9. Cotter pin
10. Nut
11. Washer
12. Bolt
13. Idler attachment
14. Link assembly
15. Nut
16. Washer
17. Bolt
18. Tube assembly
19. Linkage
20. Screw
21. Nut
22. Washer
23. Screw
24. Nut
25. Washer
26. Support bracket
27. Receiver
28. Body
29. Body and receiver set
30. Screw
31. Washer
32. Nut
33. Bolt
34. Nut
35. Washer
36. Bolt
37. Nut
38. Washer
39. Bolt
40. Nut
41. Washer
42. Jettison release mechanism
43. Bolt
44. Washer
45. Nut
46. Cargo door
47. Screw
48. Nut
49. Washer
50. Release handle
51. Jamnut
52. Bolt



1. Hinge pin
2. Hinge half
3. Structural member hinge
4. Auxiliary ramp

Figure 2-106. Replacement of Auxiliary Ramp Hinge Half

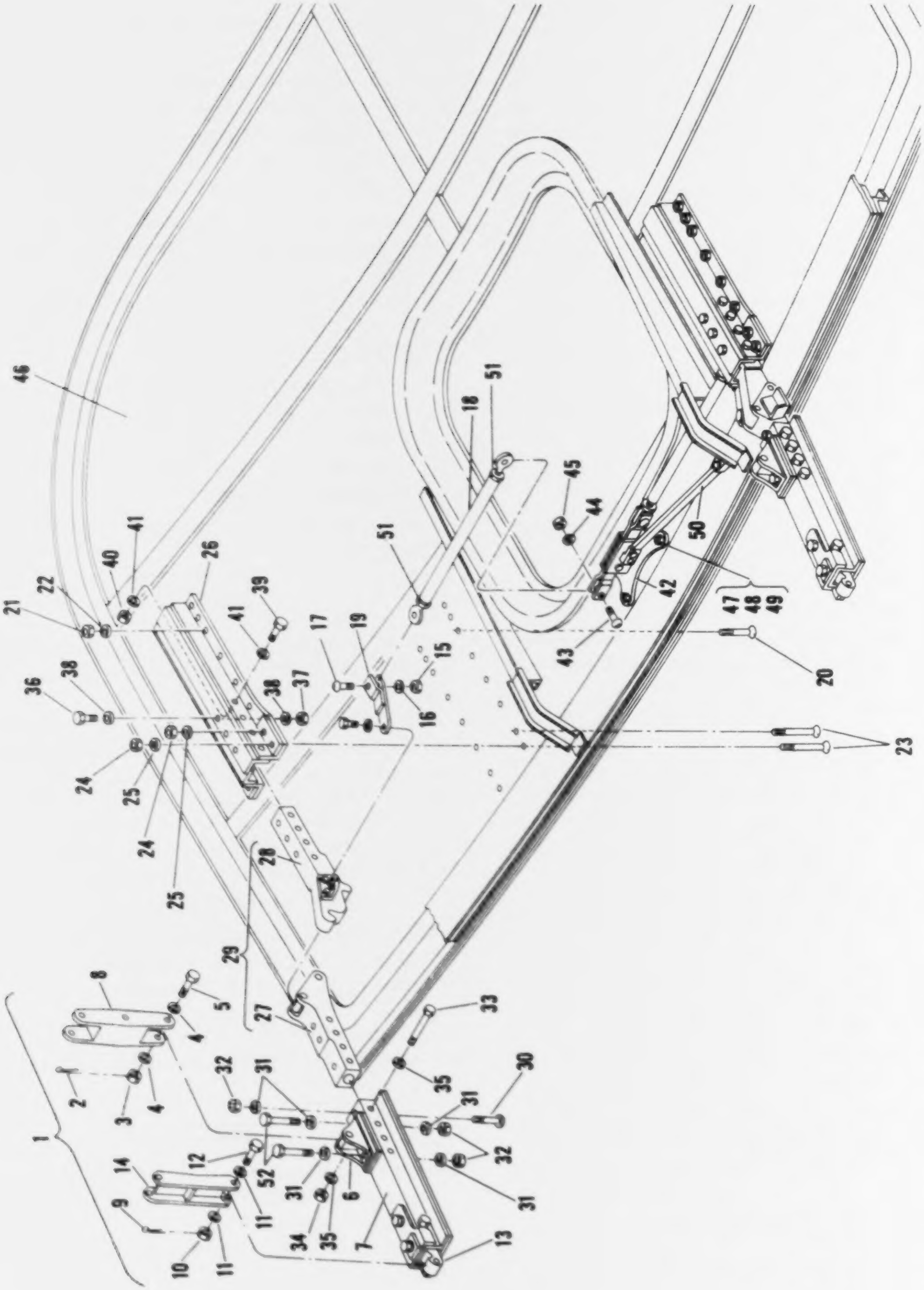

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Figure 2-107. Jettisonable Cargo Door Installation

tion. At this point, the cargo door retracts entirely into the ramp and the ramp continues on its downward path. An escape hatch is installed in the door. To provide an additional emergency exit, the ramp cargo door is jettisonable from inside the helicopter. The cargo door support beams have quick-disconnect joints called body and receiver sets. These are installed between each support bracket attaching the cargo door to the ramp. The quick-disconnect joints are unlatched through a linkage system by a centrally located release handle. The release handle is located inside the helicopter on the door structure just below the escape hatch. A self-luminous marker is installed at the end of the release handle.

2-458. Adjustment of Cargo Door. (See fig. 2-108 and 2-109.)

a. Remove the cargo loading ramp floor to expose the linkage of the trolley assembly. (Refer to para 2-448.)

b. Position the ramp so that the cargo door can be extended manually without touching the ground.

c. Manually extend the cargo door and lengthen or shorten the left and right stop bolts (1) so that the aftermost roller bearings (3) are located in the lowest position in the tracks.

d. Raise the ramp until the aft end is 0.80 to 1.00 inch from the fully closed position.

e. Loosen the center bolt on idler link fitting (7). Tighten the forward bolt and loosen the rear bolt, or vice-versa, to adjust the cargo door so that the cargo door seal contacts the coaming on the fuselage structure.

f. Manually retract the cargo door. Move the left and right actuator link fittings (4) forward or aft as required to ensure clearance between the ramp structure and the cargo door.

g. Extend the door with the ramp fully up. Align the outside skin contour of the door with the ramp skin. Do this by adjusting the left and right idler link fittings (7) and removing laminations from the left and right laminated shims (5).

NOTE

Be careful when adjusting the idler link fitting to prevent disturbing the adjustment made in step e.

h. Adjust the left and right stop bolts (1) to obtain a 0.10- to 0.30-inch clearance between the aft end of the ramp and forward edge of the cargo door.

i. Check the operation of the door. Repeat the adjustment precedure if necessary.

j. (See fig. 2-109.) After adjusting the door, adjust the turnbuckle (4) of the cable chain (5) assembly to achieve a cable tension of 50 pounds. Install a new turnbuckle safety clip.

2-459. Adjustment of Cargo Door Release Mechanism. (See fig. 2-107.)

a. To adjust the locking slides in the body of each support bracket, proceed as follows:

(1) Place release handle (50) in the locked position.

(2) Loosen both jamnuts (51) on the tube assembly (18).

(3) Turn the tube assembly (18) to tighten the locking slide in the body (28) against the pin in the receiver (27).

(4) Tighten jamnuts (51).

(5) Functionally test the jettison mechanism. (Refer to para 2-461.)

b. Adjust cargo door (46) for proper travel and sealing. (Refer to para 2-461.)

2-460. Inspection of Jettisonable Cargo Door. (See fig. 2-107.) Inspect for the following conditions:

a. Door and jettison release mechanism (42) for cracks, distortions and security.

b. Release handle (50) for locked position.

c. Security of ramp trolley assembly (1).

d. Obvious damage such as cracks, distortion, and corrosion.

e. The edge of the bonded assembly may be trimmed to provide 0.12 inch ±0.03 clearance between the door and the fuselage coaming. (See fig. 2-12.)

2-461. Functional Test of Door. (See fig. 2-107.)

a. Obtain a dial indicating scale capable of measuring 0 to 75 pounds.

b. Cover the hook end of the dial indicating scale to prevent damage to equipment.

c. Make sure that only the weight of the door is applied to the locking system.

CAUTION

Pulling the release handle more than 135° from the locked position could result in damage to the release mechanism.

d. Support the cargo door (46). Place the hook end of the dial indicating scale at the end of the release handle (50). Pull evenly until the handle leaves the detents, unlocks the locks, and releases the door. Do not pull the handle more than 135° from the locked position. The maximum allowable force to release the door by using the handle must not exceed 50 pounds.

e. Install the cargo door. (Refer to para 2-474.)

2-462. Removal. (See fig. 2-107.)

a. With utility accumulator pressurized, press and hold the utility valve manifold button. Move the ramp control lever to DN. When the ramp moves down about 1 inch, move the lever to STOP. Release the utility valve manifold button. If the utility accumulator is not charged, use the hand pump.

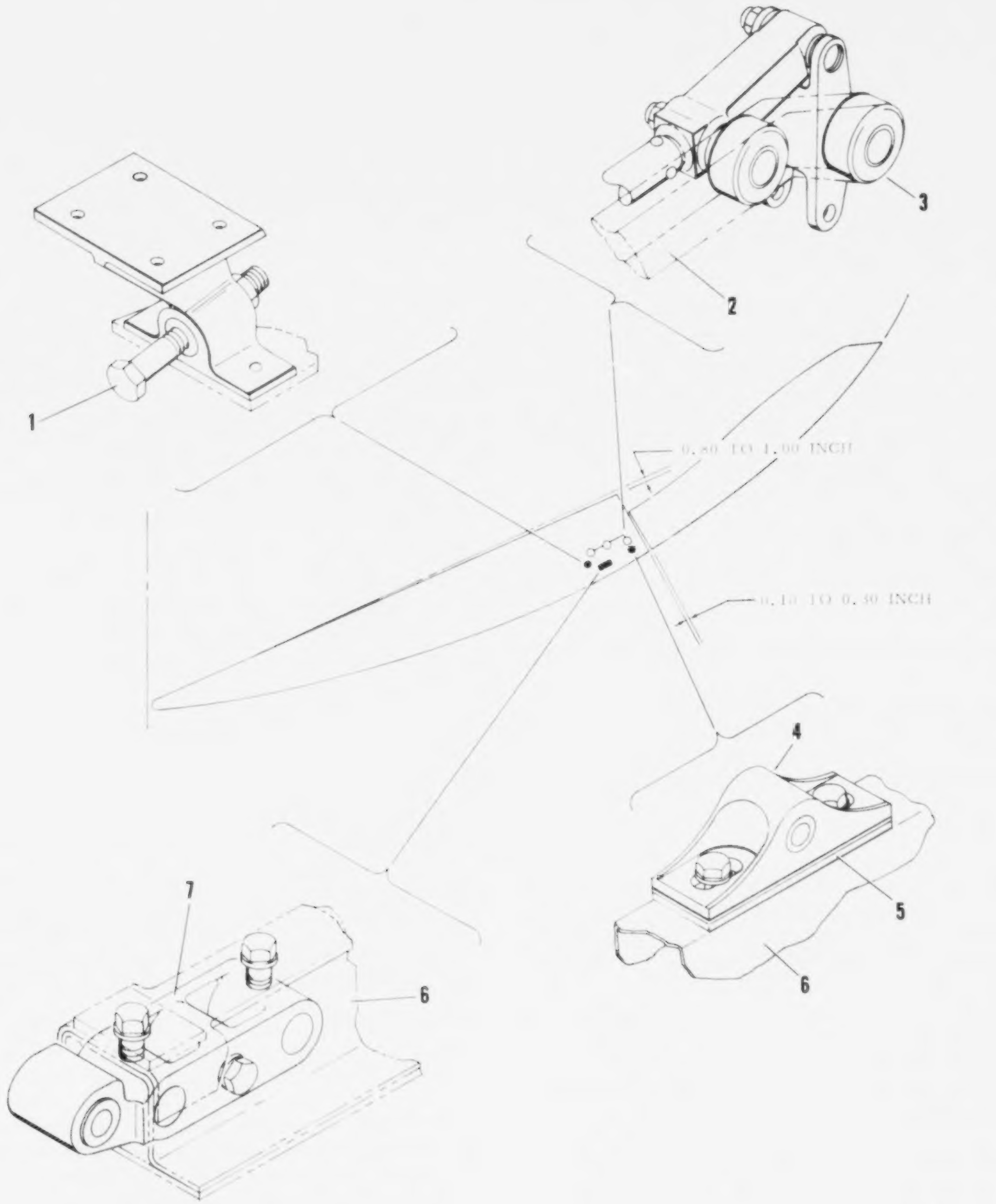
WARNING

With the system pressurized, inadvertent operation of the ramp control valve could result in personnel injury.

b. Turn the manual control valve to FILLING. This depressurizes the system.

c. Set the ramp control valve to DN. Set the lever to STOP when the ramp is level. Support the ramp in position.

d. Make sure cargo door (46) is fully extended.


3
2
1
0.80 TO 1.00 INCH
0.10 TO 0.30 INCH
4
5
6
7
6
B114-290-20

1. Left and right stop bolt
2. Track
3. Roller bearing
4. Actuator link fitting
5. Laminated shim
6. Support
7. Idler link fitting

Figure 2-108. Cargo Door Adjustment

CAUTION

Do not turn the release handle more than 135° from locked position. Damage to the release mechanism will result.

e. Support the door. Turn the release handle (50) 90° to 105° from the locked position to the jettison position. The door will separate from the ramp at the quick-disconnect body and receiver set (29). Place the door in an area where it will be adequately protected.

2-463. Removal of Door Ramp Support Bracket. (See fig. 2-107.)

a. With the cargo door trolley assembly (1) in the extended position and the cargo door removed, remove the cotter pin (2), nut (3), washers (4), and bolt (5). Remove the actuator link (8).

b. Remove the cotter pin (9), nut (10), washers (11), and bolt (12). Remove the link assembly (14). Remove the support bracket (7).

NOTE

The body and reciever set (29) is a matched set. If a body (28) is being replaced, the matching receiver (27) must also be replaced by a new body and receiver set.

2-464. Installation of Door Ramp Support Bracket. (See fig. 2-107.)

a. Place support bracket (7) (a left bracket on the left side or a right bracket on the right side) below the trolley assembly (1).

b. Lubricate the shank of bolt (5) and bolt holes in attach bracket (6) and actuator link (8). Use dry film lubricant (C208).

c. Connect attach bracket (6) to actuator link (8) of trolley assembly (1), with bolt (5), washer (4) under the bolt head, nut (3), washer (4), and cotter pin (2).

d. Lubricate shank of bolt (12) and bolt holes in the idler attachment (13) and link assembly (14). Use dry film lubricant (C208).

e. Connect idler attachment (13) to link assembly (14). Use bolt (12), washer (11) under bolt head, nut (10), washer (11), and cotter pin (9).

f. Install the cargo door. Inspect the body and receiver set for proper adjustment. (Refer to para 2-458.)

2-465. Removal of Door Support Bracket. (See fig. 2-107.)

a. Remove the cargo door. (Refer to para 2-462.)

b. Remove nut (15), washer (16), and bolt (17) from the linkage (19) of the body and receiver set (29).

c. Remove screws (20 and 23), nuts (21 and 24), washers (22 and 25). Remove support bracket (26) from the door (46).

NOTE

The body and receiver set (29) is a matched set. If a body (28) is being replaced, the matching receiver (26) must also be replaced by a new body and receiver set.

2-466. Installation of Door Support Bracket. (See fig. 2-107.)

a. Position support bracket (26) on cargo door (46).

b. Secure support bracket (26) to the door (46) with the screws (20), nuts (21), and washers (22) under the nuts.

c. Install screws (23), nuts (24), and washers (25) under the nuts.

d. Connect tube assembly (18) to linkage (19) of body and receiver set (29) with bolt (17), washer (16), and nut (15).

e. Lubricate the body locking slide. Use dry film lubricant (C208).

f. Install the cargo door. (Refer to para 2-474).

g. Inspect the body and receiver set for positive locking.

2-467. Removal of Door Receiver. (See fig. 2-107.)

a. Remove support bracket (7). (Refer to para 2-463.)

b. Remove screw (30) bolts (52), washers (31), and nuts (32).

c. Remove the four bolts (33), washers (35), nuts (34), and receiver (27) from the support bracket (7).

NOTE

The body and receiver set (29) is a matched set. If a receiver (27) is being replaced, the matching body (28) must also be replaced by a new body and receiver set.

2-468. Installation of Door Receiver. (See fig. 2-107.)

a. Position receiver (27) in support bracket (7).

b. Install screw (30), bolts (52), washers (31), and nuts (32).

c. Install the bolts (33), washers (35), one under each bolt head, and nuts (34), with one washer under each nut.

2-469. Removal of Door Body. (See fig. 2-107.)

a. Remove the support bracket (26) from the door. (Refer to para 2-463.)

b. Remove the three bolts (36), nuts (37), and washers (38).

c. Remove the eight bolts (39), washers (41), nuts (40), and body (28) from the support bracket (26).

NOTE

The body and receiver set (29) is a matched set. If a body (28) is being replaced, the matching receiver (27) must also be replaced by a new body and receiver set.

2-470. Installation of Door Body. (See fig. 2-107.)

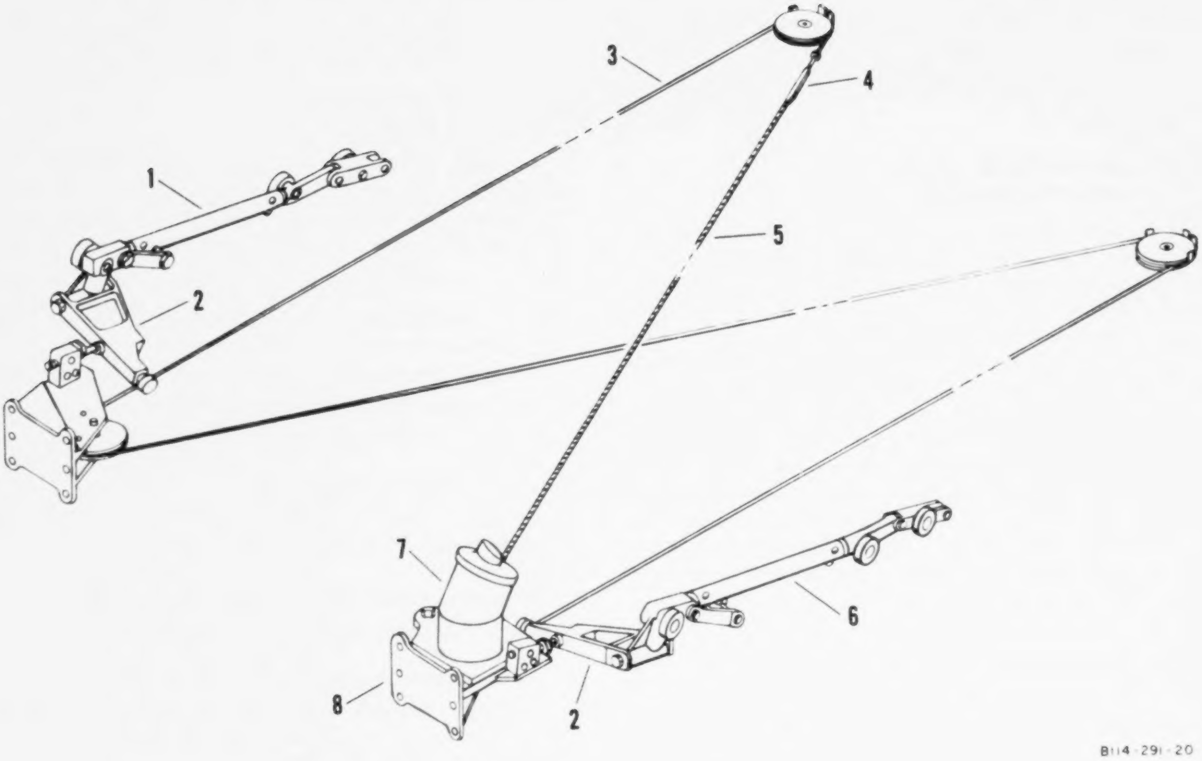
a. Position body (28) in bracket (26).

b. Install bolts (36), washers (38), one under each bolt head, and nuts (37), with a washer under each nut.

c. Install bolts (39), washers (41), under each bolt head, and nuts (40), with a washer under each nut.

2-471. Removal of Door Release Mechanism. (See fig. 2-107.)

a. Remove the cargo door. (Refer to para 2-462.)



1. Right trolley
2. Actuating link
3. Wire rope
4. Turnbuckle
5. Chain
6. Left trolley
7. Hydraulic actuator
8. Actuator support

Figure 2-109. Cargo Door Mechanism

b. Disconnect both tube assemblies (18) at each link of the jettisonable release mechanism (42) by removing the nut (45), washer (44), and bolt (43).

c. Remove screws (47), nuts (48), washers (49), and jettisonable release mechanism (42) from the cargo door.

2-472. *Installation of Door Release Mechanism.* (See fig. 2-107.)

a. Position jettisonable release mechanism (42) on the cargo door. Align the mounting holes.

b. Secure the jettisonable release mechanism (42) to the cargo door (46) with the screws (47), nuts (48), and washers (49).

c. Connect tube assemblies (18) to the link on each side of the jettsionable release mechanism (42) with the bolts (43), washers (44), and nuts (45).

d. Operate release handle (50). Note the operation of the lock in the left and right body (28).

e. Lubricate the jettison release mechanism. Use dry film lubricant (C208).

f. Install the cargo door. (Refer to para 2-474.)

g. Inspect the body and receiver set for proper adjustment.

h. Functionally test the release mechanism. (Refer to para 2-461.)

2-473. *Replacement of Door Emergency Exit Luminous Marker Lab 252 SB4-1 In.* Proceed as follows:

WARNING

> The luminous marker contains radioactive material. If it is damaged, isolate the immediate area of the marker and notify the radiological officer. If any part of the body or clothing contacts a damaged marker, wash that part of the body or clothing thoroughly.

a. Remove the nut, washer, and luminous marker.

b. Install the luminous marker and secure it with the nut and washer.

2-474. *Installation.* (See fig. 2-107.)

a. Fit the quick-disconnect body of the jettisonable cargo door support bracket (26) to the quick-disconnect receiver on the cargo ramp support bracket (7).

b. Move the release handle to the closed and locked position. The door should be locked in place. If necessary, adjust the locking mechanism. (Refer to para 2-459.)

c. Retract the door into the ramp by turning the crank handle connected to the actuator.

d. Remove the crank handle. Stow it at sta 340 on the left side of the cabin. Insert the plug into the actuator access panel in the ramp floor.

e. Check the operation of the ramp and door. (Refer to para 2-439.)

2-475. Jettisonable Cargo Door Actuating Mechanism.

(See fig. 2-109.) The cargo door mechanism is the mechanical linkage which transforms the rotary motion of the cargo door actuator into the linear motion required to extend and retract the cargo door. The cargo door mechanism consists of left and right trolley assemblies (1 and 6), two actuating link assemblies (2), a cargo door hydraulic actuator (7) and support (8), a chain (5) and wire rope (3) assembly, and pulleys. The cargo door mechanism is inside the ramp assembly. For inspection or minor adjustments, three access covers are provided on the floor panels. The actuator support has a shouldered shaft for manually retracting or extending the cargo door. The crank handle stowed on the left side of the cabin at sta 340 can be connected to the shaft of the actuator support to manually operate the cargo door.

2-476. Replacement of Cargo Door Cable-Chain. (See fig. 2-109.)

a. Remove the cargo loading ramp floor to expose the linkage of the trolley assemblies and the cable-chain. (Refer to para 2-448.)

b. Remove the bolts and washers securing the two cable guides to the aft pulleys. Remove the cable guides.

c. Remove the cotter pins, washers and pins from the forward pulley.

d. Remove the turnbuckle safety clip and the turnbuckle barrel.

e. Replace the cable-chain assembly.

f. Install the turnbuckle barrel. Position the turnbuckle as shown in fig. 2-109.

g. Install the pins, washers and cotter pins on the forward pulley.

h. Install the cable guides with the bolts and washers on the aft pulleys.

i. Adjust the turnbuckle to achieve a cable tension of 50 pounds. Install a new turnbuckle safety clip.

j. Align the swaged terminals of the cable-chain so that they are opposite each other.

k. Install the floor panels. (Refer to para 2-450.)

2-477. Inspection of Cargo Door Actuating Mechanism. (See fig. 2-109.) Inspect for the following conditions:

a. Trolley assemblies (1 and 6), actuating link assemblies (2), and pulleys for security.

b. Actuator (7) hydraulic fittings for leaks.

c. Wire rope (3) for frayed or broken strands.

d. Turnbuckle (4) and chain (5) for cracks or damage.

2-478. Repair of Components. (See fig. 2-109). Replace any broken, worn, or cracked components of the chain and wire rope assembly, or cable guides, supports and pulleys.

2-479. Jettisonable Cargo Door Actuator.

The cargo door actuator is a fixed displacement, reversible piston-type hydraulic motor. Refer to para 7-431.

2-480. Jettisonable Cargo Door Escape Hatch.

The escape hatch in the cargo door consists of a panel, a hatch seal and retainer, a seal filler, and a release strap. The release strap can be pulled from inside or outside of the cabin. A luminous marker is installed below the escape hatch.

2-481. Inspection of Cargo Door Escape Hatch. (See fig. 2-110.) Inspect for the following conditions:

a. Seal and hatch retainer (4) for condition and security.

b. Condition and availability of release strap (2).

c. Luminous marker (7) below hatch for damage.

2-482. Removal. (See fig. 2-110.)

a. Pull on the red strap (2) with sufficient force to remove the seal filler (3) from the rubber seal and hatch retainer (4).

b. Push the hatch (1) out of the hatch opening.

c. Disconnect bonding jumper (6) if installed.

2-483. Installation. (See fig. 2-110.) Proceed as follows:

a. If the external release strap has been pulled, insert release strap grommet (5) into the cutout with the snap fastener on the outside.

b. Install rubber seal and hatch retainer (4) using a solution of soap and water. Start at the right edge of the escape hatch about 6 inches above the centerline of the hatch. Install one channel of the seal over the edge of the hatch. Make sure the flat side of the seal is outboard.

c. Install the hatch into the hatch opening in the cargo door, using the lubricating solution. Make sure that the outer channel of the hatch seal fits snugly into the hatch opening.

WARNING

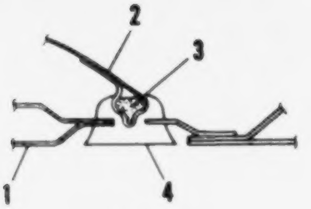
> Install the seal filler in one piece. Otherwise, when the release strap (2) is pulled, the filler will not be completely removed and the hatch will still be held firmly in place. This could result in personnel being trapped during an emergency.

d. Pass seal filler (3) through the loop of release strap (2). Start at the left side of the hatch about 6 inches below the hatch centerline. Install the seal filler using the lubricating solution so that the release strap is secured within the hatch seal at the right center of the hatch.

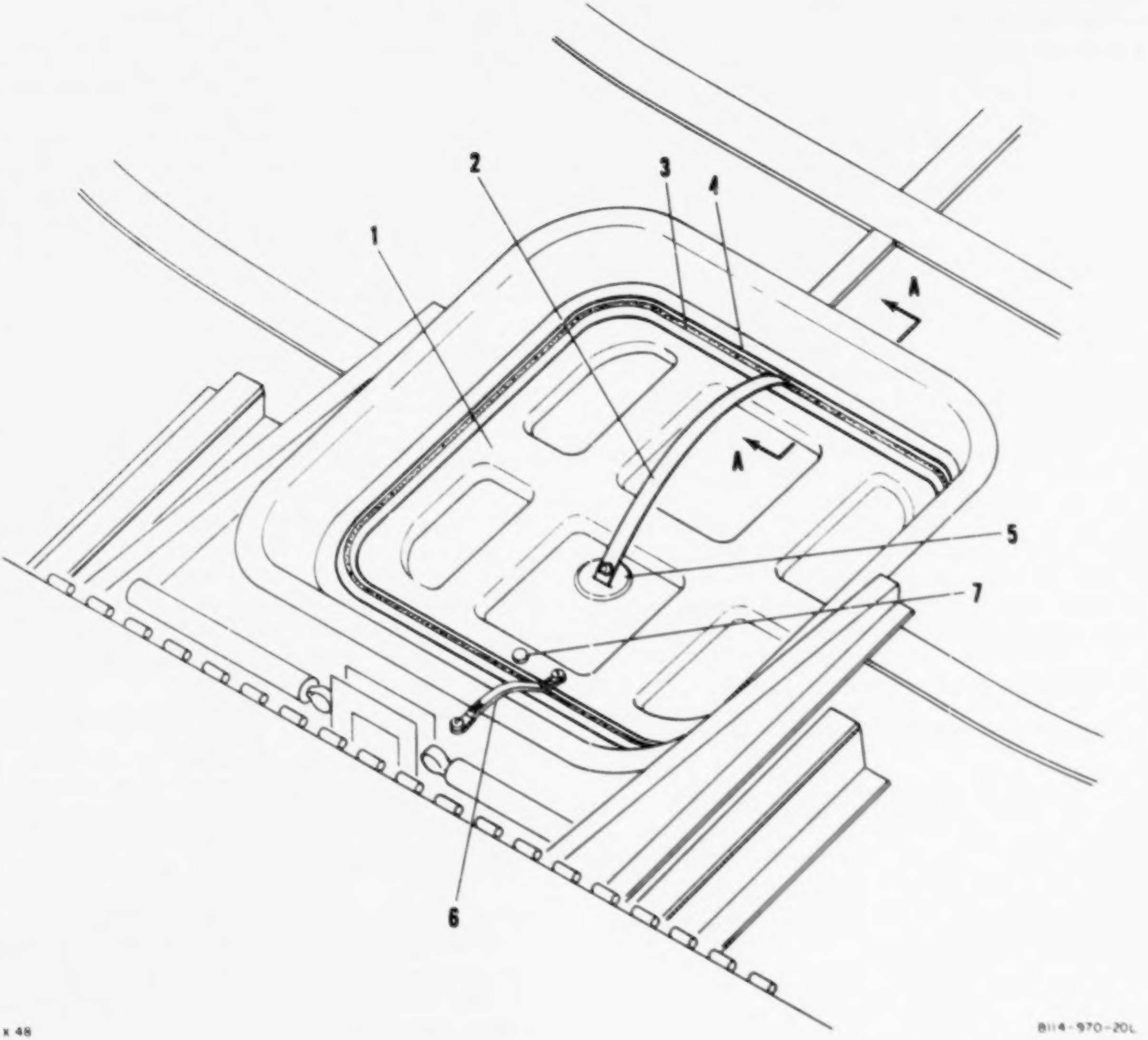
e. Connect bonding jumper (6) if installed.

2-484. Repair. Damage exceeding negligible limits can be repaired by patching, provided that the edge of the panel is not affected. See fig. 2-7 for examples of typical repairs to the panels. Refer to TM 55-1500-204-25/1 for information on repairs by spotwelding.

2-485. Replacement of Cargo Door Escape Hatch Luminous Marker. (Refer to para 2-473).



SECTION A-A


2
3
4
1
A
A
5
7
6
42 x 48
8114-970-20L

1. Escape hatch
2. Release strap
3. Seal filler
4. Seal and hatch retainer
5. Release grommet
6. Bonding jumper
7. Luminous marker

Figure 2-110. Cargo Door Escape Hatch

SECTION II EMPENNAGE

(Not Applicable)

SECTION III PYLON

2-486. Aft Pylon.

The aft pylon structure assembly is one of the four major assemblies which comprise the airframe. Refer to fig. 2-1 for assembly arrangement and identification.

2-487. Aft Pylon Structure Assembly.

a. The aft pylon structure assembly encloses the aft transmission, the transmission oil cooling fan and drive shaft, the flight control hydraulic tanks, return filters, and actuators, and dynamic absorbers. It also contains work platforms, access doors, and panels.

b. The aft pylon structure assembly is spliced with the aft fuselage structure assembly at wl +72. This splice can be separated in the field to help transport the helicopter. Forged aluminum attachment fittings are installed to secure the pylon assembly to the aft fuselage assembly. Weathertight sealing must be maintained whenever the pylon structure is separated and reinstalled. Refer to para 2-554 for fuselage sealing requirements. Refer to table 2-11 for premaintenance requirements.

c. Three decks are located longitudinally in the pylon section at wl: +72, +90.75, and +119.28 (canted). The lower deck consists of webs with extruded caps riveted to the outboard edges. The caps serve as prime members in the aft pylon structure for the aft fuselage structure splice. Formed and extruded sections are riveted across the webs. Extruded channels reinforce the cutout; the transmission torque fittings are attached to channels. The middle deck consists of two webs, one on each side of the pylon, reinforced on their inboard and outboard edges with formed and extruded sections. The upper deck is canted upward between sta 482 and 594 and contains six webs riveted together. The webs have extruded caps riveted to the outboard edges. The deck webs are stiffened with formed and extruded sections.

Table 2-11. Premaintenance Requirements for Pylon Assembly

CONDITIONS	REQUIREMENTS
Model	CH-47B/C
Part No. or Serial No.	All
Special Tools	(T15) (T16)
Test Equipment	None
Support Equipment	5,000 lb or 3,000 lb hoist as required
Minimum Personnel Required	4
Consumable Materials	None
Special Environmental Conditions	None

2-488. Cleaning.

a. Clean the inside of the aft pylon. Remove loose accumulated debris such as dirt by vacuuming.

b. Wipe up oil and grease. Use solvent (C137) and rags.

c. Clean components in the pylon such as the aft transmission, accessories on the accessory gear box, flight control bellcranks, connecting links and aft rotor shaft. Also, clean hoses, tubing, wire bundles and electrical connectors.

2-489. Inspection. (See fig. 2-111.)

a. Inspect structure in pylon for damage and cracks. Repair as required.

b. Inspect components for damage and security. Secure or replace them as required.

c. Inspect hoses, tubing, fittings, wire, and connectors for damage. Repair or replace as required.

d. Inspect access panels, covers and doors, and work platforms for missing screws, fasteners latches, and rivets.

2-490. Inspection of Field Splice Bolt Holes and Bolts. (See fig. 2-112.)

a. Remove access panels at base of pylon.

b. BACK-OFF AND RETORQUE BOLTS (1 AND 4) TO 963 TO 1,177 POUND-INCHES.

c. Make sure bolts (1 and 4) extend thru barrel nuts, but do not bottom on barrel nut retainers.

d. Install pylon access panels.

e. Inspect dynamic absorbers for security.

f. Inspect leading edge hinged fairing (clamshell doors), and latches for security.

2-491. Removal. (See fig. 2-111, sheets 1 thru 7.)

a. Remove aft rotary-wing blades. (Refer to para 5-95.)

b. Install actuating cylinder safety blocks (T29).

c. Remove hinged leading edge assembly. (Refer to para 2-505.)

d. Remove forward crown fairing. (Refer to para 2-511.)

e. If the aft transmission is installed, hoisting equipment with a lifting capacity of 5,000 pounds is required. Using 5,000 pound capacity hoist, remove aft pylon as directed in steps (1) thru (20). If the aft rotary-wing drive shaft is not installed, remove the aft pylon. (Refer to step

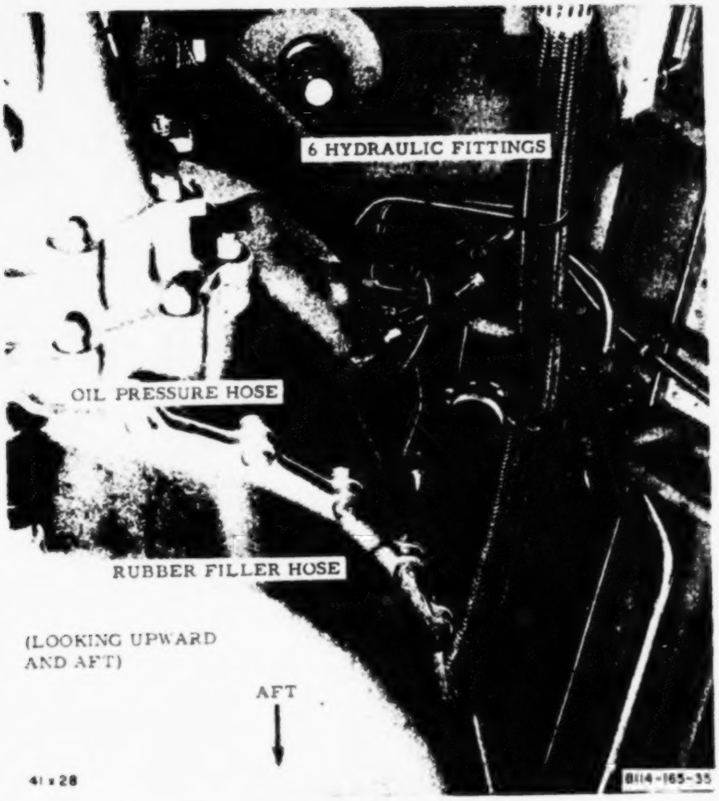


Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 1 of 7)

(21).) If the aft transmission is removed and the aft rotary-wing drive shaft is still installed in the aft pylon, remove the aft pylon. (Refer to step (22).) If the aft transmission and the aft rotary-wing drive shaft are not installed, remove the aft pylon. (Refer to step (23).)

(1) Remove both generators. (Refer to para 9-74.)

CAUTION

Protect the aft transmission splined drive with a plastic plug or cardboard. Foreign matter entering splined drive can damage splines and result in drive failure.

(2) Remove the aft synchronizing shaft. (Refer to para 6-26.)

(3) Remove the fan assembly drive shaft. (Refer to para 6-41.)

(4) Drain the utility hydraulic system. (Refer to para 7-217.)

(5) Drain two flight control hydraulic systems. (Refer to para 7-15.)

(6) Disconnect the following hydraulic lines and hoses. Cap or plug open ports. Where applicable, disconnect clamps securing lines and hoses to aft pylon structure:

(a) (See fig. 2-111, sheet 1.) The six lines from the fittings on the bottom right side of the deck at field splice wl +72.

(b) (See fig. 2-111, sheet 2.) The five lines from the fittings on the bottom right side of the deck.

(c) (See fig. 2-111, sheet 2.) Both lines from tee on bottom right side of deck.

(d) (See fig. 2-111, sheet 3.) The hoses connected to the utility system hydraulic pump.

(e) (See fig. 2-111, sheet 3.) The hoses connected to the utility system hydraulic motor.

(f) (See fig. 2-111, sheet 3.) The hoses connected to the flight control pump.

(7) Disconnect both flight control connecting links from the bellcrank at sta 527 beneath the deck. (Refer to para 11-277.)

(8) Disconnect flight control connecting link from the bellcrank at sta 537 beneath the deck. (Refer to para 11-134.)

(9) (See fig. 2-111, sheet 4.) Remove both engine fire extinguisher bottles. (Refer to para 12-40.)

(10) Drain oil from the aft transmission sump. (Refer to para 6-263.)

(11) Disconnect the following oil lines and hoses. Cap or plug open ports. Where applicable, disconnect clamps securing lines and hoses to aft pylon structure:

(a) (See fig. 2-111, sheet 3.) The aft transmission oil return hose from the oil pump and filter.

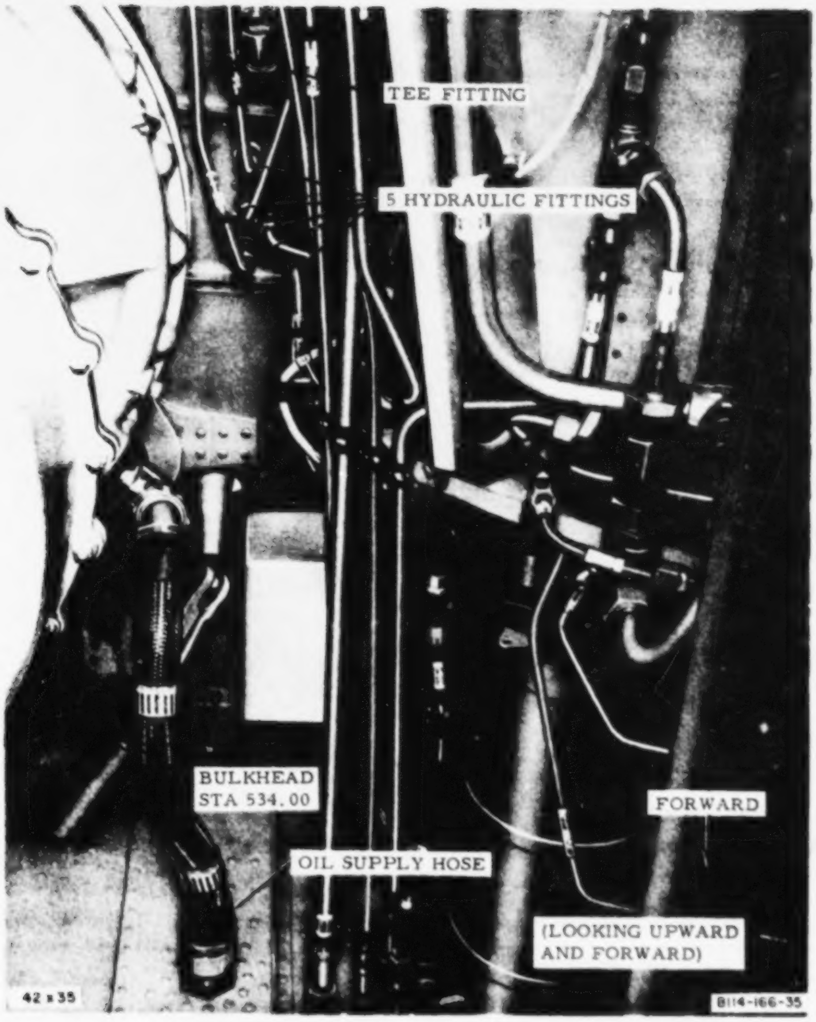


Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 2 of 7)

(b) (See fig. 2-111, sheet 2.) The aft transmission supply hose from the forward right side of the aft transmission.

(c) (See fig. 2-111, sheets 4 and 5.) The aft transmission inlet and outlet lines connected to the fittings beneath the deck near sta 532.

(d) (See fig. 2-111, sheet 1.) The aft transmission oil pressure hose from left side of aft transmission.

(e) (See fig. 2-111, sheet 1.) The aft transmission rubber filler hose.

(f) The pressure and return lines to the aft rotary-wing drive shaft thrust bearing.

(g) (See fig. 2-111, sheet 6.) The three hoses from the rear of the combining transmission. Secure hose ends to the aft pylon above the deck.

(h) (See fig. 2-111, sheet 6.) The right engine transmission pressure hose and forward transmission inlet pressure hose.

(i) (See fig. 2-111, sheet 7.) The pressure hose to the left side of the combining transmission.

(j) (See fig. 2-111, sheet 7.) The left engine transmission pressure hose and forward transmission outlet pressure hose.

(12) (See fig. 2-111, sheet 6.) Remove left engine, right engine, and combining transmission oil pressure transducers. Remove electrical cables from the aft pylon.

(13) Disconnect electrical cables from the following components. Identify and remove cable packs from the aft pylon.

NOTE

Cable packs do not have part numbers, nor are they identified as to location or function.

(a) The aft transmission oil temperature transmitter.

(b) The longitudinal cyclic trim actuator mounted on the rotary-wing head controls.

(c) The aft transmission electric chip detector.

(d) The wiring from terminal block TB26. The wiring from the cgi signal processor at wl +72 (fiberglass rotor blades).

(e) Disconnect electrical connectors from the utility hydraulic pump and two flight control pumps. Where applicable, disconnect clamps securing electrical cable packs to aft transmission or aft pylon structure.

(14) Remove the transmission oil-level check light switch bracket. Secure the bracket and cable pack clear of the aft pylon.

(15) (See fig. 2-113). Attach the aft pylon assembly sling (T15) to the pylon as follows:

(a) Fasten the longest cable of the sling to the bracket on the forward edge of the pylon. Use the quick-release pin provided with the sling.

(b) Remove the hub retaining nut cover by removing the screws and washers that attach the cover retainer to the hub oil tank.

(c) Remove the quick-release pin and detach the plug from the sling swivel.

(d) Remove the cover from the plug and screw the plug into the aft rotary-wing drive shaft.

(e) Attach the sling swivel to the installed plug with the quick-release pin.

(f) Stow the two short cables of the sling by attaching the cables to the lifting eye.

(16) Attach the aft pylon sling (T15) to a hoist having a minimum lifting capacity of 5,000 pounds. Adjust the hoist to remove slack in the hoist cable.

(17) (See fig. 2-112.) Remove the aft pylon attaching hardware. Note the locations of the nuts, washers, and bolts.

(18) Check that clamps securing system lines and electrical cable packs to the bottom face of the deck are released. Check that required plumbing and electrical connections to the aft pylon and aft transmission are disconnected.

CAUTION

Use care when placing the aft pylon on the skid to prevent damage to the aft transmission and components mounted beneath the aft pylon deck.

(19) (See fig. 2-114, sheet 1.) Raise the aft pylon and aft transmission (when installed). Place the assembly on a vertical pylon assembly skid. (See fig. 2-114, sheet 2.)

(20) If aft rotary-wing drive shaft is not installed, remove aft pylon as follows:

(a) Perform steps a., b., c., d., and e.(1) thru e.(14).

(b) Fasten the longest cables of sling to bracket on forward edge of aft pylon. Use quick-release pin provided with sling.

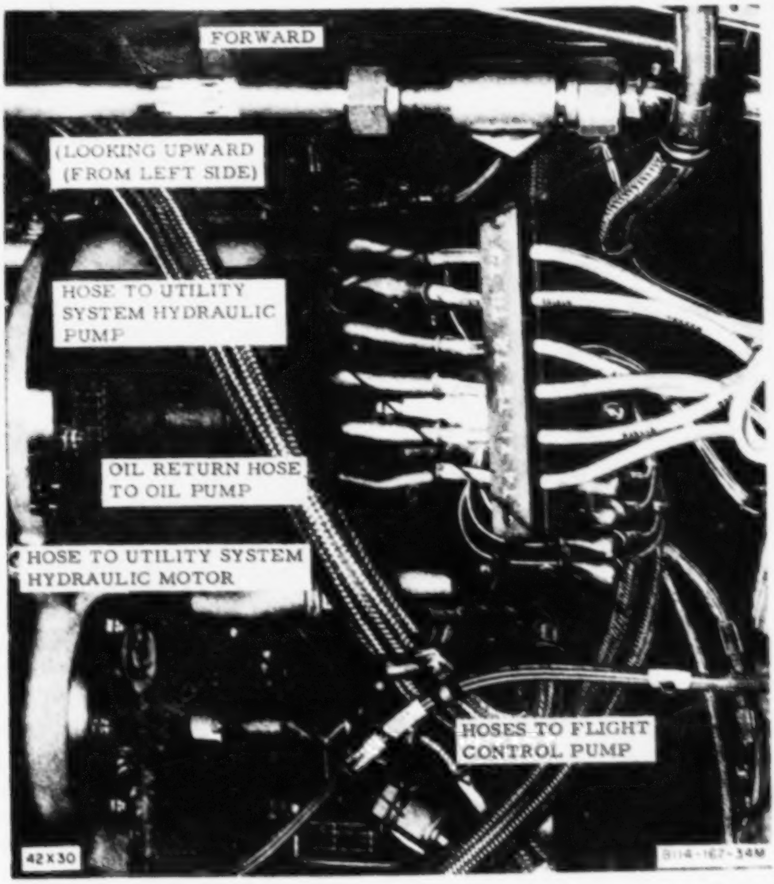

FORWARD
(LOOKING UPWARD
(FROM LEFT SIDE)
HOSE TO UTILITY SYSTEM HYDRAULIC PUMP
OIL RETURN HOSE TO OIL PUMP
HOSE TO UTILITY SYSTEM HYDRAULIC MOTOR
HOSES TO FLIGHT CONTROL PUMP
42X30

Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 3 of 7)

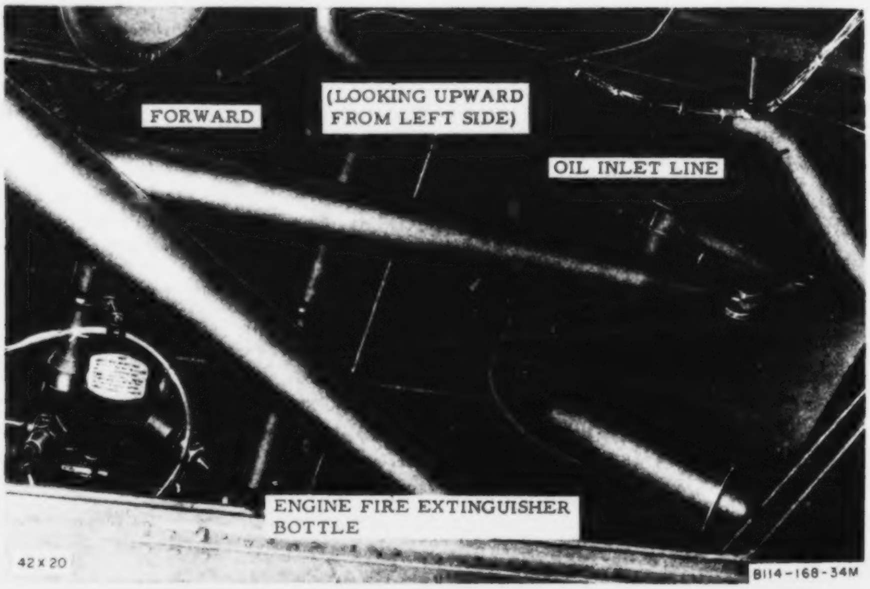

FORWARD
(LOOKING UPWARD FROM LEFT SIDE)
OIL INLET LINE
ENGINE FIRE EXTINGUISHER BOTTLE
42 X 20
B114-168-34M

Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 4 of 7)

(c) Attach two short cables of sling to air lifting brackets on pylon.

(d) Attach sling to a hoist having a lifting capacity of 4,500 pounds.

(e) Perform steps e.(17), (18), and (19).

(21) If aft transmission is removed and rotary-wing drive shaft is installed, remove aft pylon as follows:

(a) Perform steps e.(6)(a), e.(6)(b), and e.(6)(c), e.(7) thru e.(9), e.(11), e.(11)(g) thru e.(11)(j), e.(12), e.(13)(b), e.(13)(d), and e.(14).

(b) Perform steps e.(20)(b) and e.(20)(c).

(c) Attach sling to hoist having a lifting capacity of 4,000 pounds.

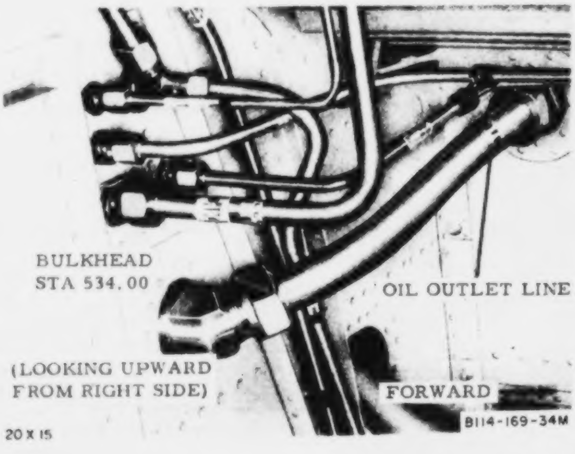


Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 5 of 7)

(d) Perform steps e.(17), e.(18), and e.(19).

(22) If aft transmission and aft rotary-wing drive shaft are not installed, remove aft pylon as follows:

(a) Perform steps b., c., and d.

(b) Perform steps e.(6)(a), e.(6)(b) and e.(6)(c).

(c) Perform steps e.(7) thru e.(9).

(d) Perform steps e.(11)(c) and e.(11)(g) thru e.(11)(j).

e. Perform step e.(12).

(f) Perform steps e.(20)(a), e.(20)(b), and e.(20)(c).

(g) Attach sling to a hoist having a minimum lifting capacity of 3,000 pounds.

(h) Perform steps e.(17), e.(18), and e.(19).

2-492. Repair—Negligible Damage. (See fig. 2-115.) Damage to the decks is limited to nicks and scratches which can be removed by burnishing. See fig. 2-7 for repair information for internal webs and formed parts. See fig. 2-4 for examples of damage to extruded parts.

2-493. Repair. (See fig. 2-115.)

a. Damage affecting less than 25 percent of a web cross section and clearing boundary members (caps) can be repaired by patching. Damage affecting only a single leg of a formed part or extruded part and not extending into the radius or heel can be repaired by patching.

b. (AVIM). Damage to a web which affects more than 25 percent of a web cross section between boundary members (caps) or which extends into the cap area should be repaired by insertion. The insertion should extend from cap to cap and pick up all exisiting stiffeners in the area. Damage to a formed part or an extruded part affecting the radius or heel should be repaired by insertion.

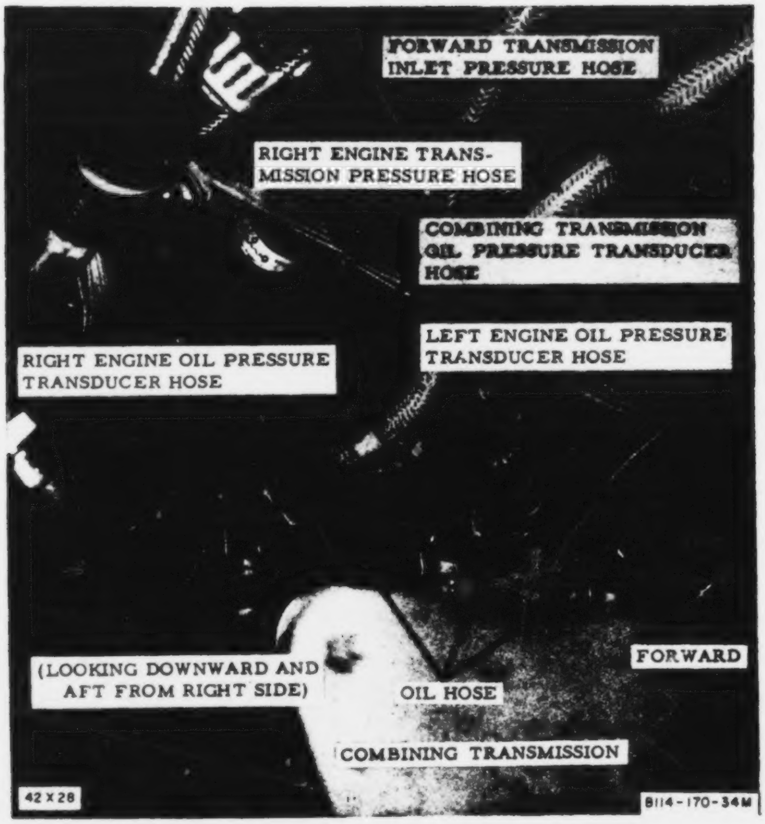

FORWARD TRANSMISSION INLET PRESSURE HOSE
RIGHT ENGINE TRANS-MISSION PRESSURE HOSE
COMBINING TRANSMISSION OIL PRESSURE TRANSDUCER HOSE
LEFT ENGINE OIL PRESSURE TRANSDUCER HOSE
RIGHT ENGINE OIL PRESSURE TRANSDUCER HOSE
(LOOKING DOWNWARD AND AFT FROM RIGHT SIDE)
FORWARD
OIL HOSE
COMBINING TRANSMISSION
42X28
B114-170-34M

Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 6 of 7)

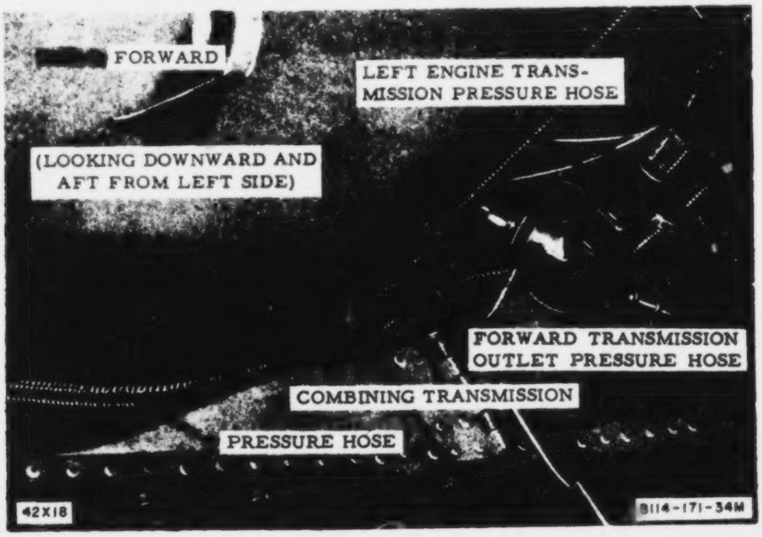
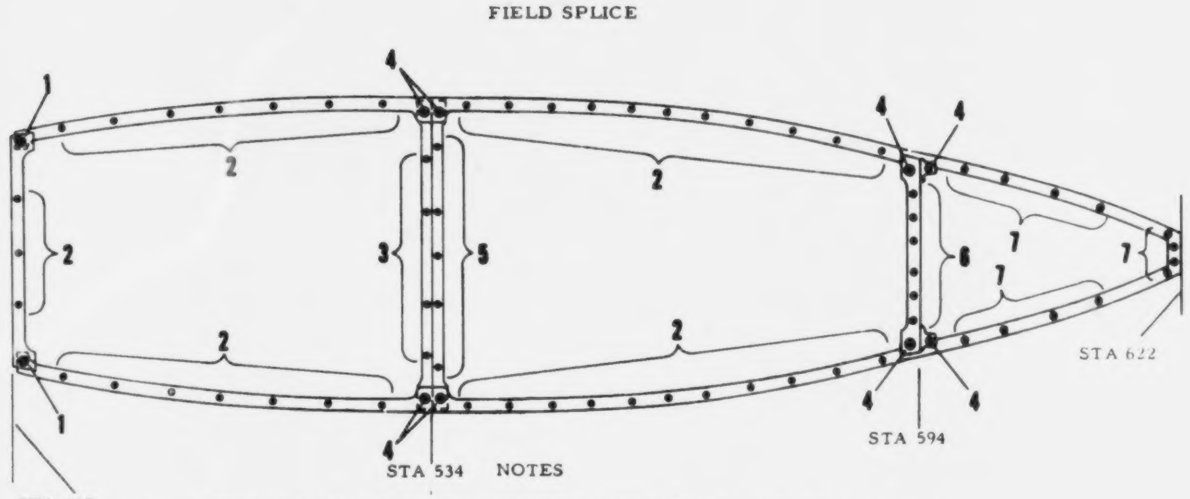

FORWARD
LEFT ENGINE TRANS-MISSION PRESSURE HOSE
(LOOKING DOWNWARD AND AFT FROM LEFT SIDE)
FORWARD TRANSMISSION OUTLET PRESSURE HOSE
COMBINING TRANSMISSION
PRESSURE HOSE
42X18
B114-171-34M

Figure 2-111. Plumbing Disconnect Points for Aft Pylon Removal (Sheet 7 of 7)



NOTES

1. REFER TO TABLE 2-12 FOR QUANTITY AND INSTALLATION INFORMATION FOR THE AFT PYLON ATTACHING HARDWARE.
2. BOLT GRIP LENGTH (LONGER OR SHORTER) MAY BE ADJUSTED BY ONE SIZE TO MEET REQUIREMENTS.
3. A TOTAL OF THREE WASHERS MAY BE USED FOR EACH BOLT-NUT COMBINATION. TWO FOR GRIP AND ONE FOR SURFACE PROTECTION.

Figure 2-112. Aft pylon field splice

2-494. Repair—Damage Necessitating Replacement. (See fig. 2-115.) Extensive damage, such as the loss of a major portion of the length of a deck member, necessitates replacement in whole or in part. When replacing members, pick up all existing rivet locations and use next larger diameter rivets. Loose, damaged, or bushings with elongated bores shall be replaced.

2-495. Installation. (See fig. 2-111, sheets 1 thru 7.)

CAUTION

Make sure all components mounted beneath the pylon deck will clear the vertical pylon assembly skid when the pylon is hoisted from skid.

a. If the aft transmission is installed, hoisting equipment with a minimum lifting capacity of 5,000 pounds is required. Using a 5,000 pound capacity hoist, install the aft pylon as in steps (1) thru (23). If the aft rotary-wing drive shaft is removed, install the aft pylon as in step b. If the aft transmission is removed and the aft rotary-wing drive shaft is still installed in the aft pylon, install the aft pylon as in step c. If the aft transmission and aft rotary-wing drive shaft are removed, install the aft pylon as in step d.

CAUTION

Do not apply sealant to mating surfaces of aft pylon and fuselage before joining surfaces. Erroneous torque values to pylon attachment bolts will result. Erroneous torque values to pylon attachment bolts could result in damage to aircraft.

(1) Install the aft pylon assembly sling (T15). (Refer to para 2-491, step e.(15)(a) thru e.(15)(f), and step e.(16).) Apply one coat of zinc chromate primer to the mating surfaces. Allow primer to dry before joining surfaces. Apply fillet seal on the outside of sta 482 to sta 622 after joining crown panel and pylon.

(2) (See fig. 2-114.) Raise the pylon and position it in its location on the aft fuselage section. Align attaching hardware locations as pylon is lowered into position.

(3) (See fig. 2-112 and table 2-12.) Install pylon attaching bolts, nut, and washers. **TORQUE NAS628 BOLTS (1 AND 4) TO 963 TO 1177 POUND-INCHES.** Remove pylon sling.

NOTE

Bolts (7) between sta 594 and sta 622 are installed with heads pointing down.

(3.1) Apply sealant on external surface at parting of pylon and with aft fuselage section (para 2-559).

(4) Install the transmission oil-level check light switch bracket. Secure cable pack, where applicable, to the aft structure or aft pylon.

(5) Install cable packs in the aft pylon. Connect them to the following components:

(a) The electrical connectors to utility hydraulic pump and two flight control pumps. Where applicable, connect clamps securing electrical cable packs to aft transmission on aft pylon structure.

(b) The wiring to terminal block TB26.

(c) The aft transmission electric chip detector.

(d) The aft transmission oil temperature transmitter.

(e) The longitudinal cyclic actuator mounted on rotary-wing head controls.

(f) The wiring to CGI signal processor at wl +72 (fiberglass rotor blades).

(6) (See fig. 2-111, sheet 6.) Install left engine, right engine, and combining transmission oil pressure transducers. Where applicable, connect cable pack clamps to aft pylon structure.

(7) Connect the following oil lines and hoses. Where applicable, connect clamps securing lines to aft pylon structure or aft transmission:

(a) (See fig. 2-111, sheet 6.) The right engine transmission pressure hose and forward transmission inlet pressure hose.

(b) (See fig. 2-111, sheet 7.) The left engine transmission pressure hose and forward transmission outlet pressure hose.

(c) (See fig. 2-111, sheet 7.) The pressure hose to left side of the combining transmission.

(d) (See fig. 2-111, sheet 6.) The three hoses to the rear of the combining transmission.

(e) The pressure and return lines to the aft rotary-wing drive shaft thrust bearing.

(f) (See fig. 2-111, sheet 1.) The aft transmission filler hose.

(g) (See fig. 2-111, sheet 1.) The aft transmission oil pressure hose to the left side of the aft transmission.

(h) (See fig. 2-111, sheets 4 and 5.) The aft transmission inlet and outlet lines to unions beneath the deck at field splice wl +72 at about sta 532.

(i) (See fig. 2-111, sheet 2.) The aft transmission supply hose to the forward right side of the aft transmission.

(j) (See fig. 2-111, sheet 3.) The aft transmission oil return hose to the oil pump and filter.

(8) Refill the aft transmission sump with oil. (Refer to para 1-6.)

(9) Install two fire extinguisher bottles. (Refer to para 12-46.)

(10) Connect flight control connecting link to bellcrank at sta 537 beneath deck.

(11) Connect two flight control connecting links to bellcrank at sta 527 beneath deck.

(12) Perform a flight control system motion check. (Refer to para 11-73.)

(13) If required, adjust the flight control system rigging. (Refer to para 11-10.)

(14) Where applicable, attach clamps securing lines and hoses to aft pylon structure or aft transmission. Connect the following hydraulic lines and hoses:

(a) (See fig. 2-111, sheet 3.) The hoses connected to the flight control pump.

(b) (See fig. 2-111, sheet 3.) The hoses connected to the utility system hydraulic motor.

(c) (See fig. 2-111, sheet 3.) The hoses connected to the utility hydraulic system pump.

(d) (see fig. 2-111, sheet 2.) The two lines to the tee on the bottom right side of the deck.

(e) (See fig. 2-111, sheet 2.) The five lines to the fittings on the bottom right side of the deck.

(f) (See fig. 2-111, sheet 1.) The six lines to the fittings on the bottom right side of the deck.

(15) Check hydraulic accumulators.

(16) Service utility hydraulic system (refer to para 1-12) and service the two flight control hydraulic systems. (Refer to para 1-14.)

(17) Install the fan assembly drive shaft. (Refer to para 6-39.)

(18) Install the aft synchronizing shaft. (Refer to para 6-31.)

(19) Install the two ac generators. (Refer to para 9-77.)

(20) Install the forward crown fairing. (Refer to para 2-514.)

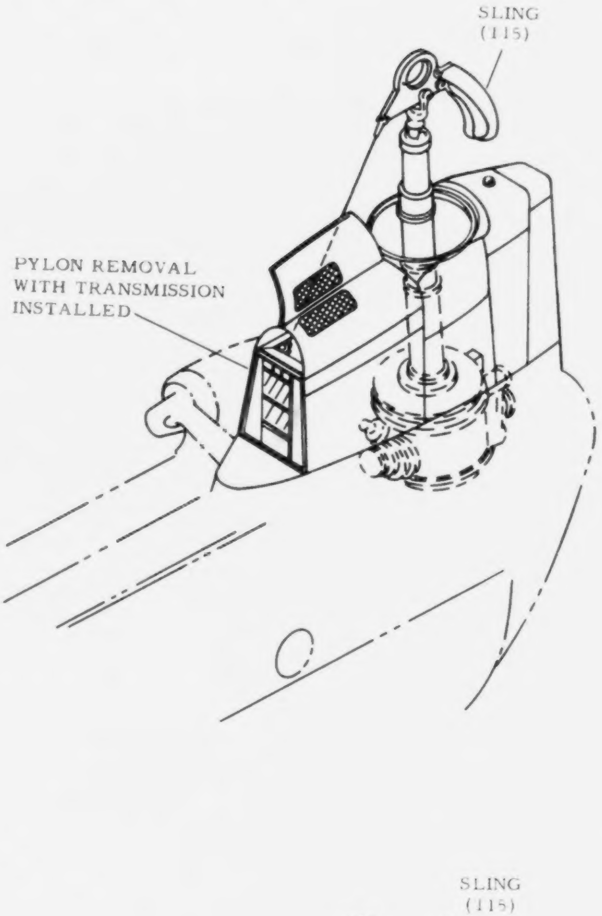
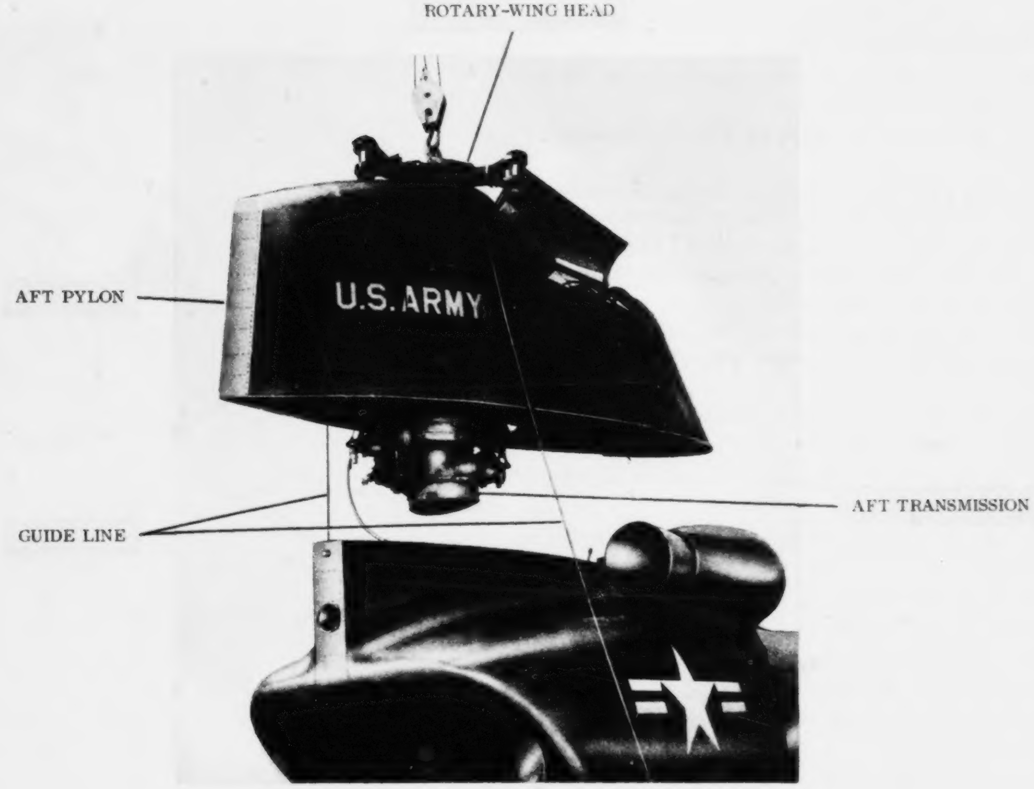

SLING (115)
PYLON REMOVAL WITH TRANSMISSION INSTALLED
SLING (115)
PYLON REMOVAL WITH TRANSMISSION REMOVED
SKID (116)
20x51
B114 172 34V

Figure 2-113. Aft Pylon Sling Installation



PYLON REMOVAL WITH THE
AFT TRANSMISSION, VERTICAL
DRIVE SHAFT, ROTOR HEAD
AND INTEGRAL SYSTEMS INSTALLED

42 X 36

BII4-594-34V

Figure 2-114. Removal of Pylon Section (Sheet 1 of 2)

(21) Install the hinged leading edge. (Refer to para 2-508.)

(22) Install the aft rotary-wings. (Refer to para 5-104.)

(23) Remove the actuating cylinder safety blocks (T29).

b. If the aft rotary-wing drive shaft is removed, install aft pylon as follows:

(1) Perform step e.(20)(b) of para 2-491.

(2) Perform steps a.(2) thru a.(9) of this para.

(3) Install the aft rotary-wing drive shaft. (Refer to para 6-75.)

(4) Perform steps a.(4) thru a.(23) of this para.

c. If the aft transmission is removed and the aft rotary-wing drive shaft is still installed in the aft pylon, install the aft pylon as follows:

(1) Perform step e.(20)(b) of para 2-491.

(2) Perform steps a.(2) and a.(3) of this para.

(3) Install the aft transmission assembly. (Refer to para 6-112.)

(4) Perform steps a.(4) thru a.(23) of this para.

d. If the aft transmission and aft rotary-wing drive shaft are removed, install the aft pylon as follows:

(1) Perform step e.(20)(b) of para 2-491.

(2) Perform steps a.(2) and a.(3) of this para.

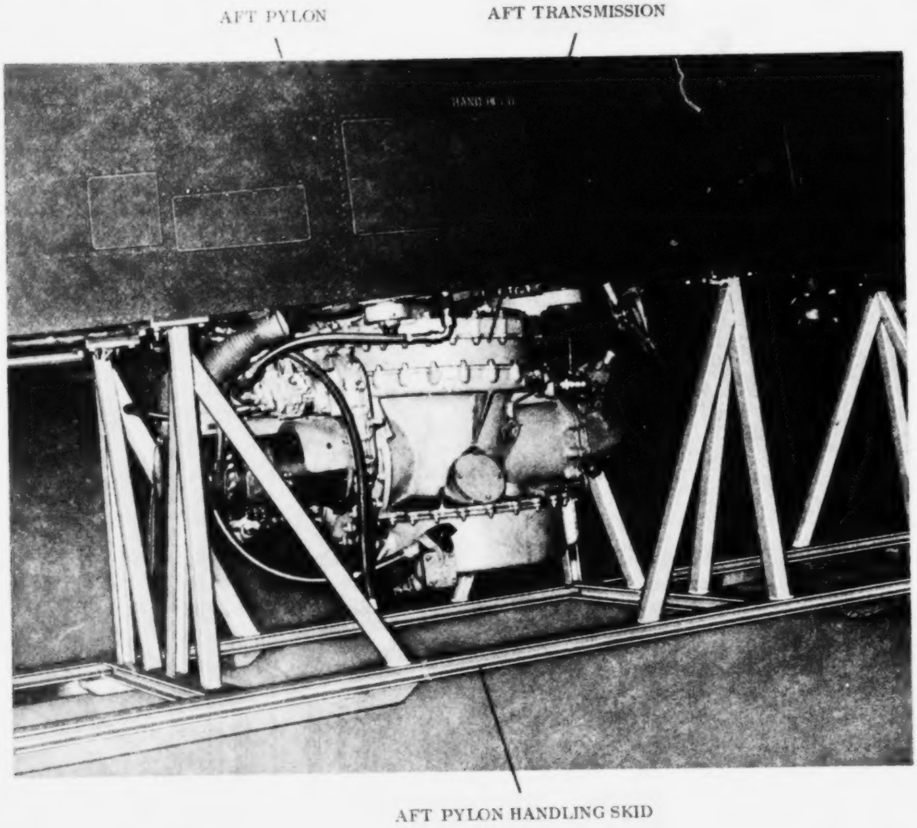
(3) Install the aft transmission. (Refer to para 6-112.)

(4) Install the aft rotary-wing drive shaft. (Refer to para 6-75.)

(5) Perform steps a.(4) thru a.(23) of this para.

2-496. Fairings, Doors, and Access Panels—Aft Pylon Structure Assembly.

Subsequent text describes the construction and classification of damage for the aft pylon fairings. Oil-canning of all the fairing skins, except the midcrown fairing, is



PYLON SHOWN ON HANDLING SKID
WITH THE AFT TRANSMISSION, VERTICAL
DRIVE SHAFT, ROTOR HEAD AND
INTEGRAL SYSTEMS INSTALLED

42 X 38

B114-174-34V

Figure 2-114. Removal of Pylon Section (Sheet 2 of 2)

permissible to 0.120 inch maximum depression, or 0.060 inch maximum elevation, as measured by laying a straightedge across adjacent ribs.

2-497. Hinged Fairing (Work Platforms).

(See fig. 2-116.) The pylon section work platforms are of sandwich honeycomb construction and one is located on each side of the pylon. When open, the work platforms provide accessibility to the rotor and drive system components.

The top inboard surface of the work platform, viewed in the open position, is made of rigidized 2024-T4 aluminum alloy. Walkway material is applied diagonally in 1-inch-wide stripes, 1-inch apart, to this surface. Fittings are bolted to each side of the platform for attachment of the support cables. Hinges are bolted to the inboard edge for installation to the fairing. A formed angle is riveted longitudinally between the cable attachment fittings along the outboard edge of the rigidized areas. A formed angle is bonded and bolted to the forward edge of the work platform.

2-498. Inspection of Aft Work Platforms. (Refer to para 2-410.)

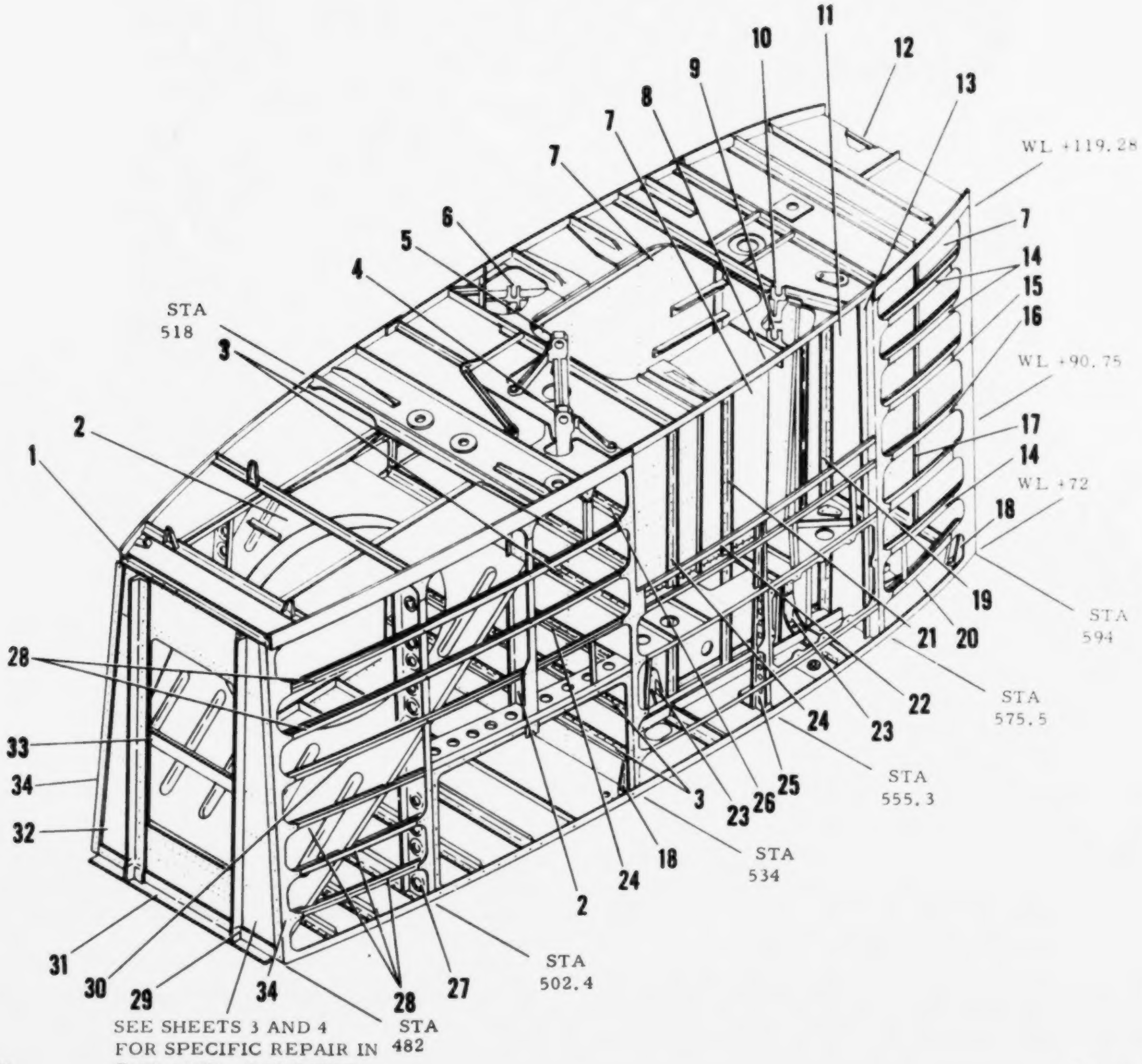
2-499. Removal. (See fig. 2-116.)

a. Open the work platforms (1). Remove the nuts (2), washers (3) and bolts (4) that attach the cable assemblies (5) to the work platform.

b. Disconnect the bonding jumpers (6).

c. Remove the lockwire if applicable and remove the bolts (7), washers (8), bushings (9), and washers (8) from the hinge fittings (10). Remove the work platform (1) from the helicopter.

AFT PYLON ASSEMBLY REPAIRS


11
10
12
9
13
8
7
7
WL +119.28
6
7
5
14
4
15
STA
518
16
3
WL +90.75
2
17
1
14
WL +72
18
19
STA
594
28
21
20
22
STA
575.5
33
24
23
34
3
23
26
25
STA
555.3
32
18
STA
534
24
2
31
STA
502.4
30
29
34
28
27
STA
482

SEE SHEETS 3 AND 4
FOR SPECIFIC REPAIR IN
THIS AREA, EACH SIDE

42x40

B114 255 34S

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 1 of 9)

AFT PYLON ASSEMBLY REPAIRS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CHANNEL	0.063 2024-T3 CLAD	0.063 2024-T3 CLAD	--
2	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	--
3	STIFFENER	ALCOA 59675 7075-T6	0.050 4130	--
4	BEAM	BAC 1505-100524 2024-T4	NOTE B.	--
5	BEAM	BAC 1505-100524 2024-T4	NOTE C.	--
6	ATTACHMENT	--	NOTE D.	2-119
7	WEB	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	2-7
8	CAP	VS90525 7075-T6	--	--
9	ATTACHMENT	--	NOTE E.	--
10	△ATTACHMENT	--	NOTE F.	--
	☐ATTACHMENT	--	NOTE G.	--
11	WEB	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD	2-7
12	CAP	BAC 1514-539 7075-T6	--	--
13	ANGLE	0.050 7075-T6 CLAD	0.063 7075-T6 CLAD	--
14	STRINGER	ALCOA 83264 7075-T6	--	--
15	TEE	HARVEY 15152 7075-T6	--	--
16	STRINGER	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	--
17	ANGLE	0.090 7075-T6 BARE	0.100 7075-T6 CLAD	--
18	ATTACHMENT	--	NOTE H.	--
19	TEE	REYNOLDS 26598 7075-T6	--	--
20	STRINGER	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	--
21	CHANNEL	0.063 301 1/2H CRES	0.063 301 1/2H CRES	--
22	STRINGER	HARVEY 15078 7075-T6	0.063 4130	--
23	ATTACHMENT	--	NOTE I.	--
24	CHANNEL	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
25	FORMER	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
26	ANGLE	AND10133-1203 2024-T4	--	--
27	FORMER	0.050 2024-T3 BARE	0.063 2024-T3 CLAD	--
28	STRINGER	VS70503-1 7075-T6	0.032 4130	--
29	ANGLE	AND10134-1201 7075-T6	0.063 4130	--
30	STRINGER	VS70503-3 7075-T6	0.050 4130	--
31	ANGLE	ALCOA 61971 7075-T6	0.063 4130	--
32	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
33	TEE	ALCOA 49225 7075-T6	0.063 4130	--
34	HINGE HALF	MS20001H6	NOTE J.	2-131

△ USED ON HELICOPTERS SERIAL NO. 66-19098 THRU 67-18508
☐ USED ON HELICOPTERS SERIAL NO. 67-18509 AND SUBSEQUENT

NOTES

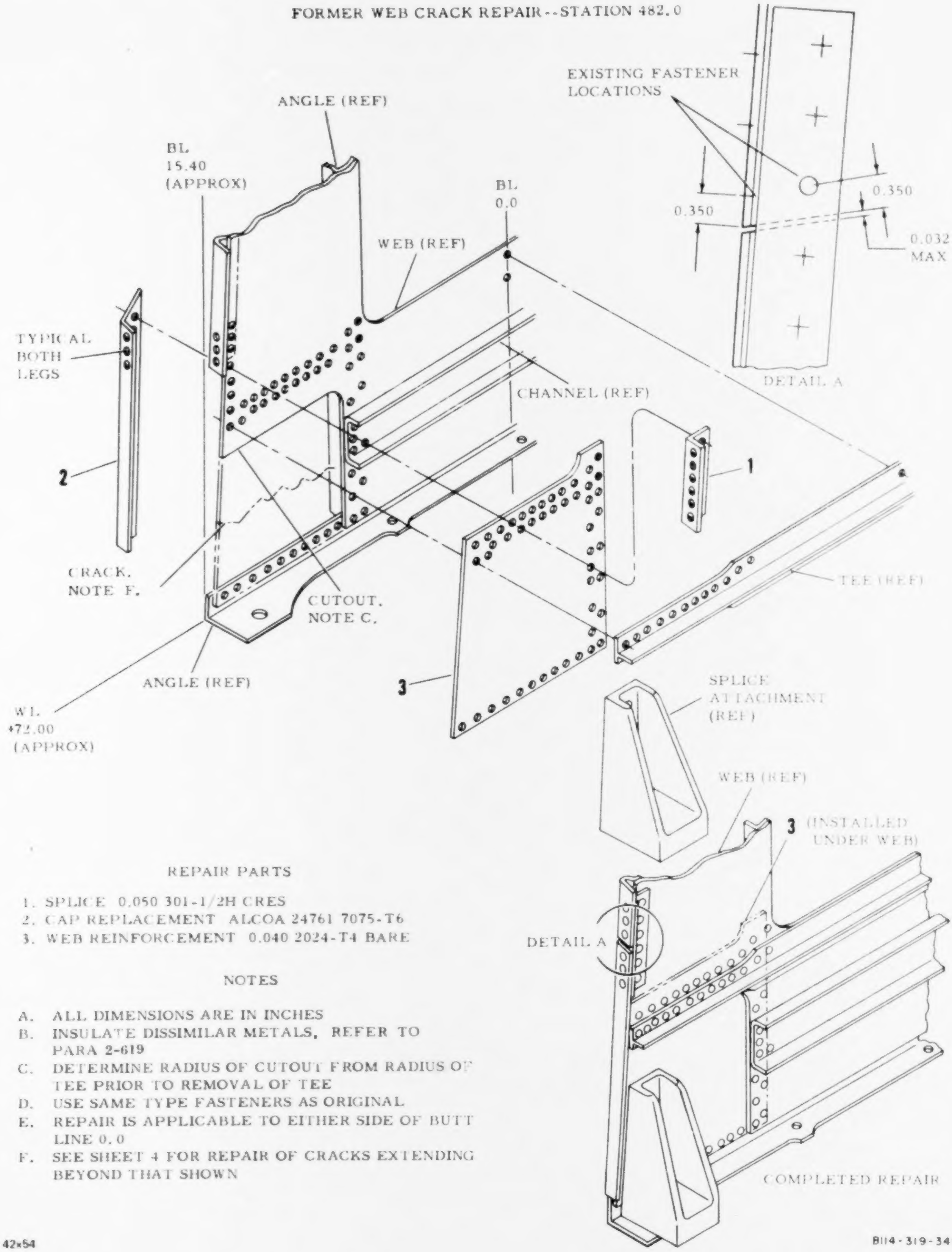
A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH NEW BEAM 114S4119-56 IF DAMAGE IS MORE THAN NEGLIGIBLE
C. REPLACE WITH NEW BEAM 114S4119-57 IF DAMAGE IS MORE THAN NEGLIGIBLE
D. REPLACE WITH NEW ATTACHMENT 114S4836-1 IF DAMAGE IS NOT REPARABLE
E. REPLACE WITH NEW ATTACHMENT 114S4835-1 IF DAMAGE IS MORE THAN NEGLIGIBLE
F. REPLACE WITH A NEW ATTACHMENT 114S4811-1 IF DAMAGE IS MORE THAN NEGLIGIBLE
G. REPLACE WITH NEW ATTACHMENT 114S4811-5 IF DAMAGE IS MORE THAN NEGLIGIBLE
H. REPLACE WITH NEW ATTACHMENT 114S4801-1 IF DAMAGE IS MORE THAN NEGLIGIBLE
I. REPLACE WITH NEW ATTACHMENT 114S4805-4 IF DAMAGE IS MORE THAN NEGLIGIBLE. USE LOCATING FIXTURE 114G1247-1 . REPLACE ATTACHMENTS SEPARATELY TO PREVENT MISLOCATION
J. REFER TO PARA 2-657 FOR HINGE REPAIR

42x45

B114-276-345V

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 2 of 9)

FORMER WEB CRACK REPAIR--STATION 482.0


EXISTING FASTENER LOCATIONS
ANGLE (REF)
BL 15.40 (APPROX)
BL 0.0
WEB (REF)
0.350
0.350
0.032 MAX
DETAIL A
TYPICAL BOTH LEGS
CHANNEL (REF)
1
2
CRACK, NOTE F.
CUTOUT, NOTE C.
TEE (REF)
ANGLE (REF)
3
WL +72.00 (APPROX)
SPLICE ATTACHMENT (REF)
WEB (REF)
3 (INSTALLED UNDER WEB)
DETAIL A
COMPLETED REPAIR

REPAIR PARTS

1. SPLICE 0.050 301-1/2H CRES
2. CAP REPLACEMENT ALCOA 24761 7075-T6
3. WEB REINFORCEMENT 0.040 2024-T4 BARE

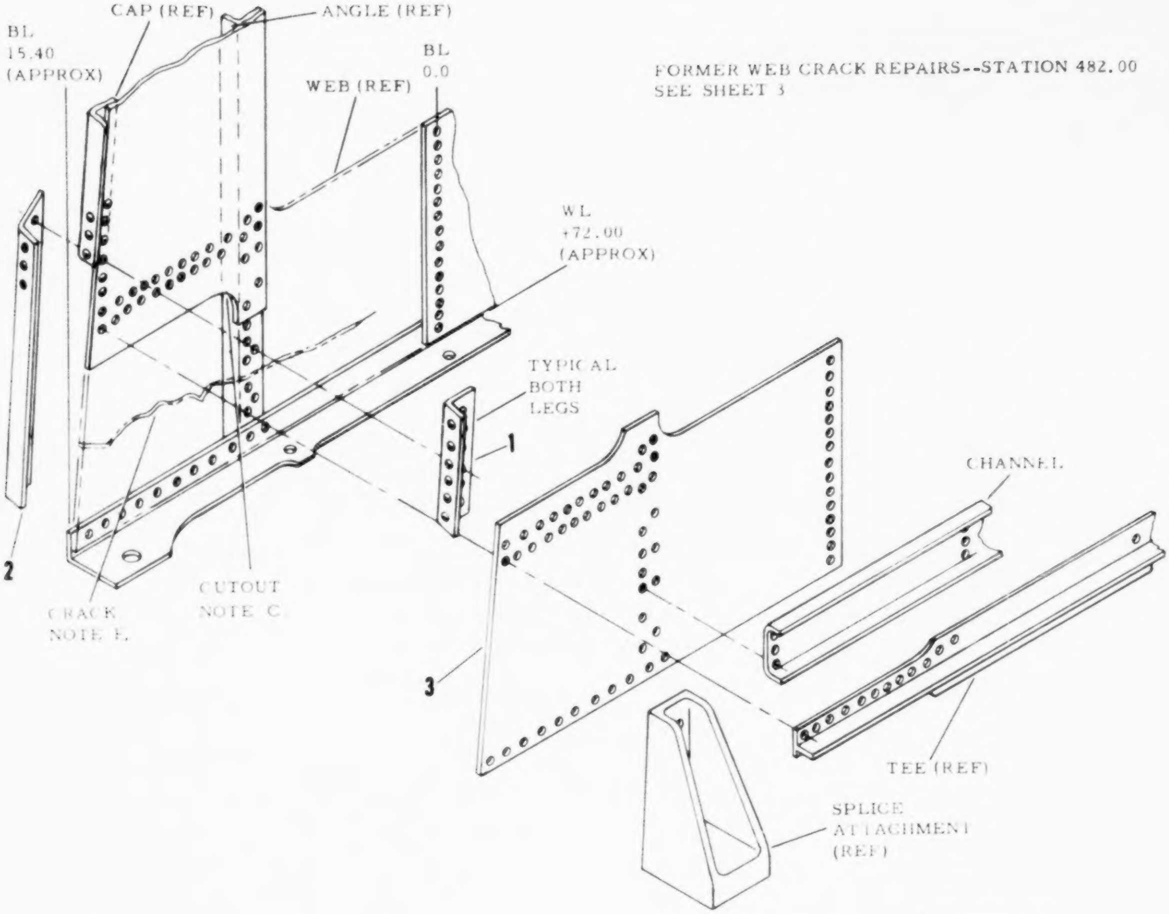
NOTES

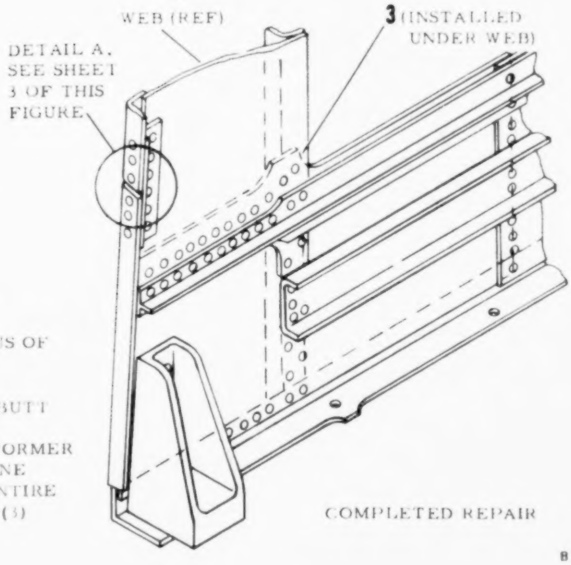
A. ALL DIMENSIONS ARE IN INCHES
B. INSULATE DISSIMILAR METALS, REFER TO PARA 2-619
C. DETERMINE RADIUS OF CUTOUT FROM RADIUS OF TEE PRIOR TO REMOVAL OF TEE
D. USE SAME TYPE FASTENERS AS ORIGINAL
E. REPAIR IS APPLICABLE TO EITHER SIDE OF BUTT LINE 0.0
F. SEE SHEET 4 FOR REPAIR OF CRACKS EXTENDING BEYOND THAT SHOWN

42x54

B114-319-34SV

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 3 of 9)


CAP (REF)
ANGLE (REF)
BL
15.40
(APPROX)
BL
0.0
WEB (REF)
FORMER WEB CRACK REPAIRS--STATION 482.00
SEE SHEET 3
WL
+72.00
(APPROX)
TYPICAL
BOTH
LEGS
1
2
CRACK
NOTE F.
CUTOUT
NOTE C.
CHANNEL
3
TEE (REF)
SPLICE
ATTACHMENT
(REF)


WEB (REF)
3 (INSTALLED
UNDER WEB)
DETAIL A,
SEE SHEET
3 OF THIS
FIGURE
COMPLETED REPAIR

REPAIR PARTS

1. SPLICE 0.050 301-1/2H CRES
2. CAP REPLACEMENT ALCOA 24761 7075-T6
3. WEB REINFORCEMENT 0.040 2024-T4 BARE

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. INSULATE DISSIMILAR METALS. REFER TO PARA 2-619
C. DETERMINE RADIUS OF CUTOUT FROM RADIUS OF TEE PRIOR TO REMOVAL OF TEE
D. USE SAME TYPE FASTENERS AS ORIGINAL
E. REPAIR IS APPLICABLE TO EITHER SIDE OF BUTT LINE 0.0
F. CRACKS OCCURRING ON EACH SIDE OF THE FORMER OR EXTENDING BEYOND BUTT LINE 0.0 ON ONE SIDE CAN BE REPAIRED BY SPANNING THE ENTIRE AREA WITH A SINGLE WEB REINFORCEMENT (3)

42x54

B114 320 345V

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 4 of 9)

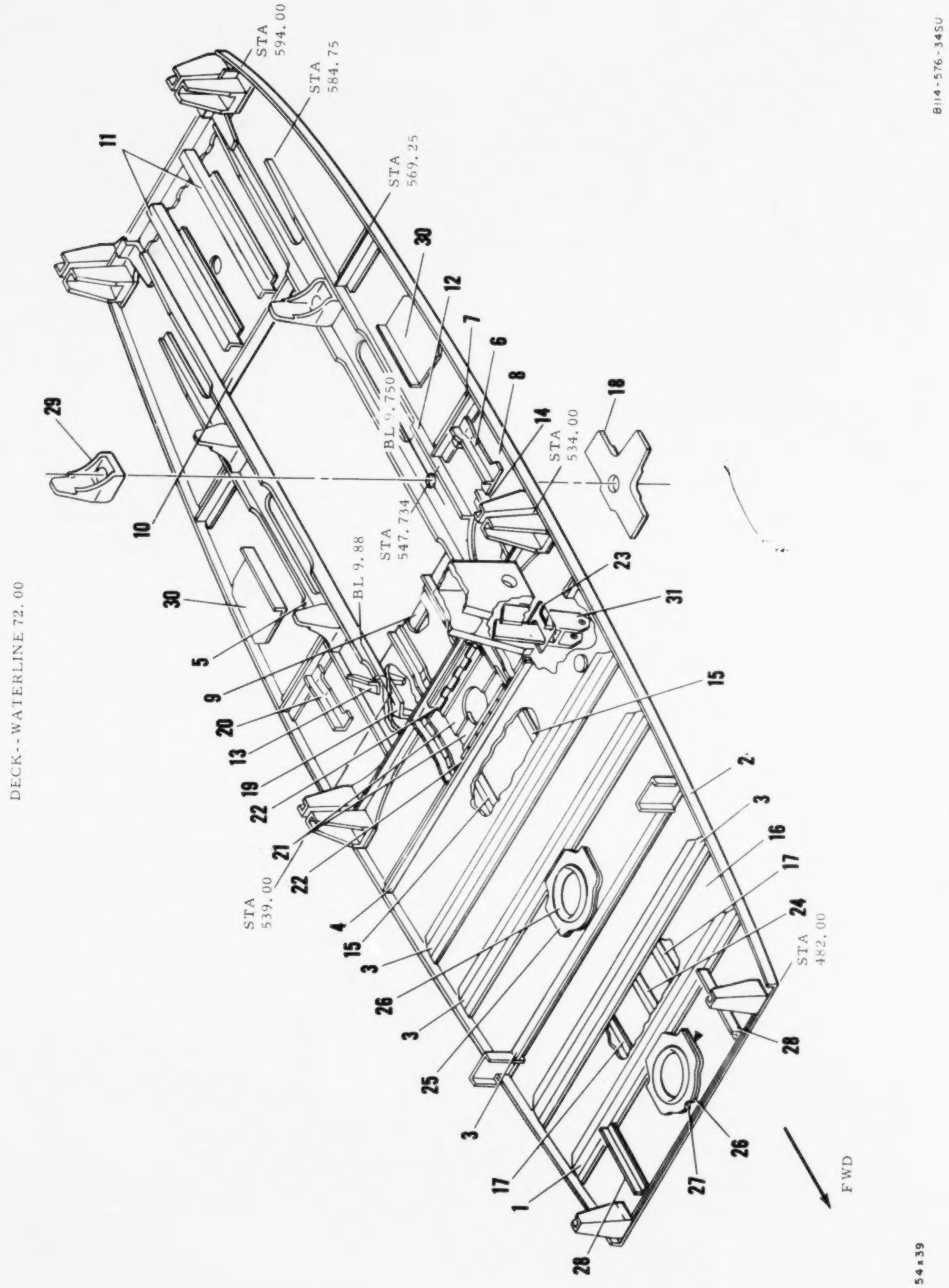
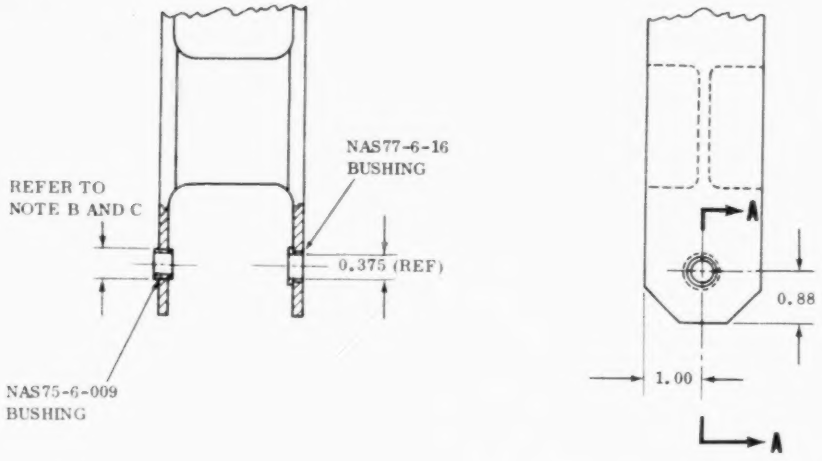
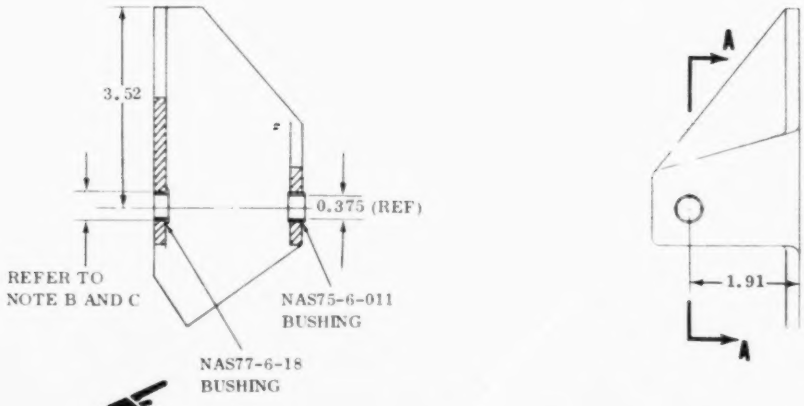

DECK--WATERLINE 72.00
STA 594.00
STA 584.75
STA 569.25
STA 547.734
STA 539.00
STA 534.00
STA 482.00
BL 9.750
BL 9.88
FWD
1
2
3
3
3
3
3
4
5
6
7
8
9
10
11
12
13
14
15
15
16
17
17
18
19
20
21
22
22
23
24
25
26
26
27
28
28
29
30
30
31
B114-576-345U
54x39

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 5 of 9)

SUPPORT ASSEMBLY 114S4824-1


REFER TO NOTE B AND C
NAS77-6-16 BUSHING
0.375 (REF)
NAS75-6-009 BUSHING
A
0.88
1.00
A

SUPPORT ASSEMBLY 114S4823-1


3.52
0.375 (REF)
REFER TO NOTE B AND C
NAS75-6-011 BUSHING
NAS77-6-18 BUSHING
A
1.91
A

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. IF BUSHING MOUNTING HOLES ARE WORN OR ELONGATED, LINE REAM BOTH SIDES

C. 80 MICROINCHES (RMS) MAX SURFACE FINISH

42X54

8114-574-345V

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 6 of 9)

DECK REPAIRS WATERLINE 72.00

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	ZEE	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
2	CAP	ALCOA 13816 7075-T6	0.125 4130	--
3	ZEE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
4	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
5	CHANNEL	NAS345-134 7075-T6	0.160 4130	--
6	TEE	ALCOA 62409 7075-T6	0.100 4130	--
7	TEE	AND10136-2002 7075-T6	0.100 4130	--
8	WEB	0.063 7075-T6 BARE	0.063 7075-T6 CLAD	2-7
9	STIFFENER	AND10134-1205 7075-T6	0.125 4130	--
10	STIFFENER	AND10133-1002 7075-T6	0.125 4130	--
11	ZEE	AND10138-1004 7075-T6	0.071 4130	--
12	CHANNEL	NAS345-134 7075-T6	0.160 4130	--
13	ANGLE	ALCOA 62564 7075-T6	0.080 4130	--
14	ANGLE	ALCOA 27778 7075-T6	0.100 4130	--
15	STIFFENER	VS70504-3 7075-T6 BARE	0.025 7075-T6 CLAD	--
16	WEB	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
17	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	--
18	PLATE	0.375 4340 STEEL	NOTE B.	--
19	SUPPORT ASSY	114S4823	NOTE F.	--
20	ANGLE	ALCOA 16869 7075-T6	NOTE B.	--
21	DOOR	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
22	HINGE ASSY	--	NOTE C.	--
23	DOUBLER	0.040 7075-T6 BARE	NOTE B.	--
24	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
25	RETAINER	0.025 2024-T4 CLAD	NOTE D.	--
26	SEAL	0.032 SILICON RUBBER SHEET	NOTE B.	--
27	RETAINER	0.025 2024-T4 CLAD	NOTE E.	--
28	ANGLE	VS70504-3 7075-T6 BARE	0.025 7075-T6 CLAD	--
29	SUPPORT	AZ80 AF MAG. AL. FORG	NOTE B.	--
30	DOUBLER	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	2-7
31	SUPPORT ASSY	114S4824	NOTE G.	--

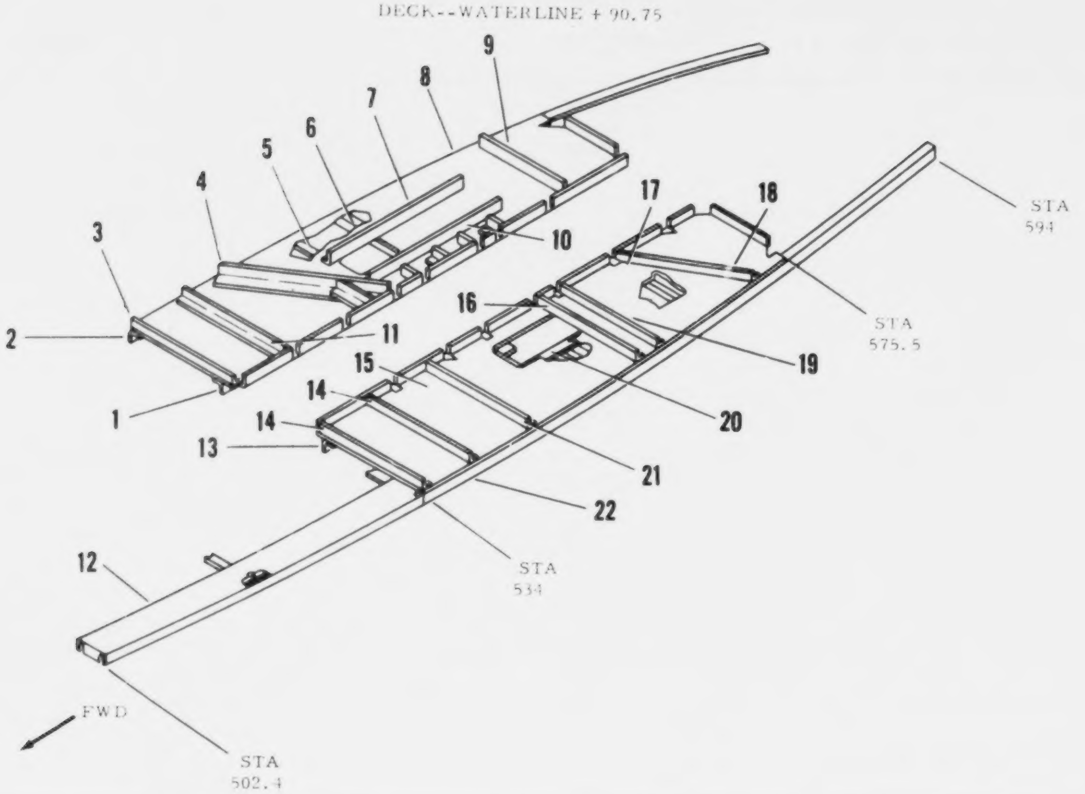
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE WITH SAME MATERIAL AS ORIGINAL
C. MAKE HINGE HALF FROM AN257XP2. MAKE HINGE PIN FROM AN253-2. CRIMP END OF HINGE TO RETAIN PIN
D. REPLACE WITH NEW RETAINER 114S4113-129
E. REPLACE WITH NEW RETAINER 114S4113-127
F. REPAIR AS SHOWN ON SHEET 2 THIS FIG. OR REPLACE WITH NEW SUPPORT ASSEMBLY 114S4823-1
G. REPAIR AS SHOWN ON SHEET 2 THIS FIG. OR REPLACE WITH NEW SUPPORT ASSEMBLY 114S4824-1

42 x 54

B114-575-345V

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 7 of 9)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
2	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
3	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
4	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
5	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
6	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
7	ANGLE	HARVEY 15078 7075-T6	0.063 4130	--
8	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
9	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
10	ANGLE	HARVEY 15078 7075-T6	0.063 4130	--
11	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
12	CHANNEL	0.040 7075-T6 BARE	0.040 7075-T6 CLAD	--
13	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
14	ANGLE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
15	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
16	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
17	CHANNEL	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
18	ANGLE	AND10133-0701 7075-T6	0.040 7075-T6 CLAD	--
19	ANGLE	REYNOLDS 5761 7075-T6	0.070 4130	--
20	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--
21	ANGLE	HARVEY 15078 7075-T6	0.063 7075-T6 CLAD	--
22	ANGLE	ALCOA 22477 7075-T6	0.050 4130	--

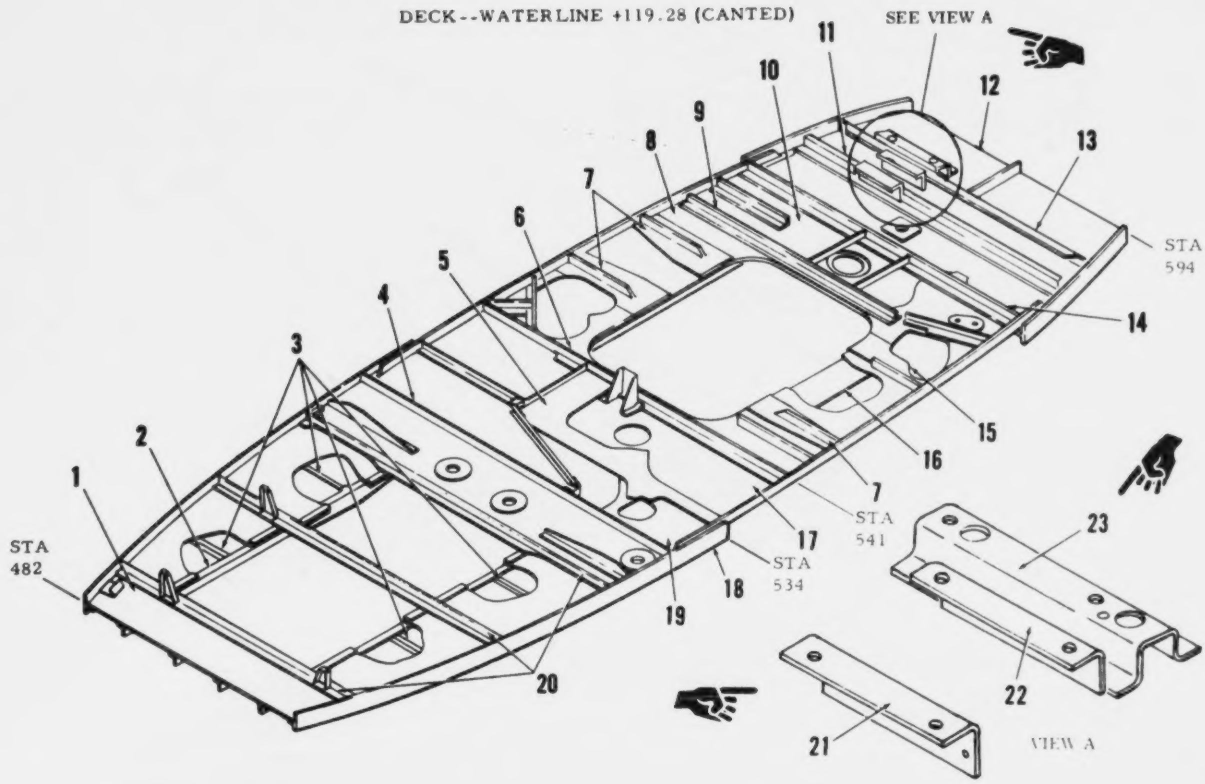
NOTE

ALL DIMENSIONS ARE IN INCHES

42x51

B114-169-345V

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 8 of 9)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	2-7
2	ANGLE	ALCOA 45827 7075-T6	0.080 4130	--
3	ANGLE	VS70504-3	0.032 4130	--
4	TEE	ALCOA 52057 7075-T6	0.063 4130	--
5	DOUBLER	0.063 2024-T4 BARE	0.071 2024-T3 CLAD	2-7
6	TEE	AND10136-2006 7075-T6	--	--
7	TEE	ALCOA 33185 7075-T6	--	--
8	WEB	0.050 301 CRES 1/4 HD	0.063 301 CRES 1/4 HD	2-7
9	TEE	AND10136-1406 7075-T6	0.100 4130	--
10	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	2-7
11	ZEE	0.063 7075-T6 BARE	0.071 7075-T6 CLAD	--
12	WEB	0.032 2024-T3 CLAD	0.040 2024-T3 CLAD	2-7
13	ZEE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
14	ANGLE	ALCOA 12883 7075-T6	0.063 4130	--
15	ANGLE	REYNOLDS 8158 7075-T6	0.125 4130	--
16	ANGLE	0.125 301 CRES 1/4 HD	0.125 301 CRES 1/4 HD	--
17	WEB	0.032 301 CRES 1/2 HD	0.040 301 CRES 1/2 HD	2-7
18	CAP	VS90525 7075-T6	0.125 4130	--
19	DOUBLER	0.063 2024-T4 CLAD	0.071 2024-T3 CLAD	--
20	TEE	REYNOLDS 19810	--	--
21	ANGLE	0.50 2024-T3 CLAD	NOTE C.	--
22	ANGLE	0.40 2024-T3 CLAD	NOTE D.	--
23	BRACKET	0.50 2024-T3 CLAD	NOTE E.	--

NOTE

A. ALL DIMENSIONS ARE IN INCHES
B. STATIONS SHOWN REPRESENT THE CENTERLINE OF OVERLAP OF THE WEBS
C. REPLACE WITH NEW ANGLE 114S4114-6
D. REPLACE WITH NEW ANGLE 114S4114-5
E. REPLACE WITH NEW BRACKET 114S4114-12

42 x 54

B114-167-34S

Figure 2-115. Structure Assembly Repairs—Aft Pylon Structure Assembly (Sheet 9 of 9)

Table 2-12. Aft Pylon Attaching Hardware

INDEX	ITEM AND QUANTITY	PART NUMBER	REMARKS
1	Bolt (2 ea) Washer (2 ea) Nut (2 ea) Retainer (2 ea)	NAS628-26 MS20002C8 2752-080 294055 Ret	
2	Bolt (39 ea) Washer (39 ea) Washer (39 ea) Nut (39 ea)	AN4-6A AN960D416L AN960D416 MS21045-4	 1 under head 1 under nut
3	Bolt (4 ea) Washer (8 ea) Nut (4 ea)	AN4-6A AN960D416 MS21044N4	1 under head and 1 under nut
4	Bolt (8 ea) Washer Nut (8 ea) Retainer (8 ea)	NAS628-28 MS20002C8 2752-080 294055	ON CH-47B at sta 594 and on CH-47C at sta 534 and sta 594 add washer VS15306-8 (2 max.) under washer MS20002C8, as required to prevent bolt interfering with barrel nut retainer
5	Bolt (5 ea) Washer (15 ea) Nut (5 ea)	AN4-6A AN960D416 MS21045-4	1 under head and 2 under nut
6	Bolt (6 ea) Washer (6 ea) Washer (6 ea) Nut (6 ea)	AN4-5A AN960D416L AN960D416 MS21045-4	 1 under head 1 under nut
7	Bolt (12 ea) Washer (12 ea)	AN4-5A AN960D416	Bolts are installed with heads pointing down

NOTES

1. Bolt grip length (longer or shorter) may be adjusted by one size to meet requirements.
2. A total of three washers may be used for each bolt-nut combination. Two for grip and one for surface protection.
3. See fig. 2-112 for aft pylon field splice attaching hardware location.
4. One MS20002-8 washer may be used in place of one VS15306-8 washer.

2-500. Repair. (See FO-7.) Refer to TM 55-1500-204-25/1 for damage classifications for the sandwich honeycomb floor section. Nicks, scratches, dents, and small cracks are negligible, provided that they can be corrected by a simple procedure, such as stop-drilling cracks, removing dents, and burnishing nicks and scratches. Damage must clear all bolts, rivets and radiuses a minimum of ¾ inch and must not interfere with opening and closing of the platform. Reapply walkway material to repaired areas.

2-501. Replacement of Pylon Work Platform Heavy Duty Latches. (See fig. 2-116.) Work platforms have heavy duty latches (15). To remove the latches:

a. Open the work platform.

b. Remove the six screws (12) and washers (13) from the latch. Remove latch (15).

c. When replacing the latch, remove angles (14) from latch. Keep angles for installation.

To install the latches:

a. Install angles (14) on new latch (15).

b. Position latch on work platform. Align latch with the mounting holes.

c. Install screws (12) and washers (13).

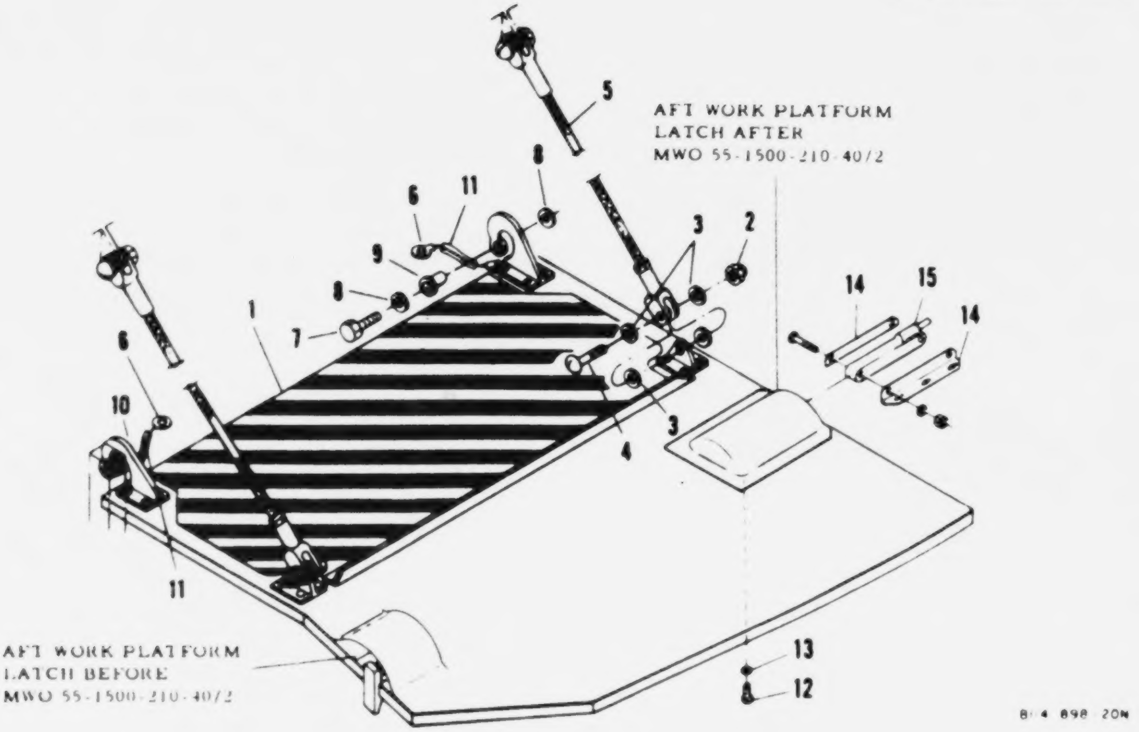
d. With left and right latches installed, close the work platform. Check that latches hold the work platform closed.

2-501.1. Repair of Heavy Duty Latch.

a. If the turnlock stud is worn, remove grooved pin from shank of turnlock.

b. Replace turnlock and install a new grooved pin.

c. Insure pine extends approximately the same distance on each side of the turnlock shank.



AFT WORK PLATFORM
LATCH AFTER
MWO 55-1500-210-40/2

AFT WORK PLATFORM
LATCH BEFORE
MWO 55-1500-210-40/2

1	Work platform	6	Bonding jumper	11	Insulating sleeving
2	Nut	7	Bolt	12	Screw
3	Washer	8	Washer	13	Washer
4	Bolt	9	Bushing	14	Angle
5	Cable assembly	10	Hinge fitting	15	Latch

Figure 2-116. Pylon Work Platform

2-502. Installation. (See fig. 2-116.)

a. Position work platform (1) on the pylon. Install washer (8), bushing (9), washer (8), and bolt (7) at both hinge fittings (10). Lockwire the bolts if applicable. Use lockwire (C206).

b. Secure cable assemblies (5) to the work platform using bolt (4), washer (3) under the bolt head, washer (3) on each side of the lug and nut (2), with washers (3) under the nut.

b.1. Check that the work platform does not deflect more than 0.38 inch at each attaching point with both cables taut.

c. Inspect insulating sleeving (11) of both bonding jumpers (6). If they are deteriorated or missing, install new sleeving as follows:

(1) Slide a 10-inch length of sleeving (C367) on bonding jumper (6).

(2) Tie the sleeving to the jumper at both ends. Use twine (C369).

d. Connect bonding jumpers (6).

2-502.1. Remove Composite Pylon Hinged Fairing (Work Platform). (See fig. 2-116.1.)

NOTE

Procedure is same to remove left and right work platform. Removal of left platform is shown here.

a. Lower worK platform (1) and remove cotter pin (2), washer (3), and pin (4) from each of two cables (5) and platform brackets (6).

b. Remove lockwire from bolt (7). Remove bolt, washer (8), bushing (9), and washer (10) from each of two hinge fittings (11). Remove work platform (1).

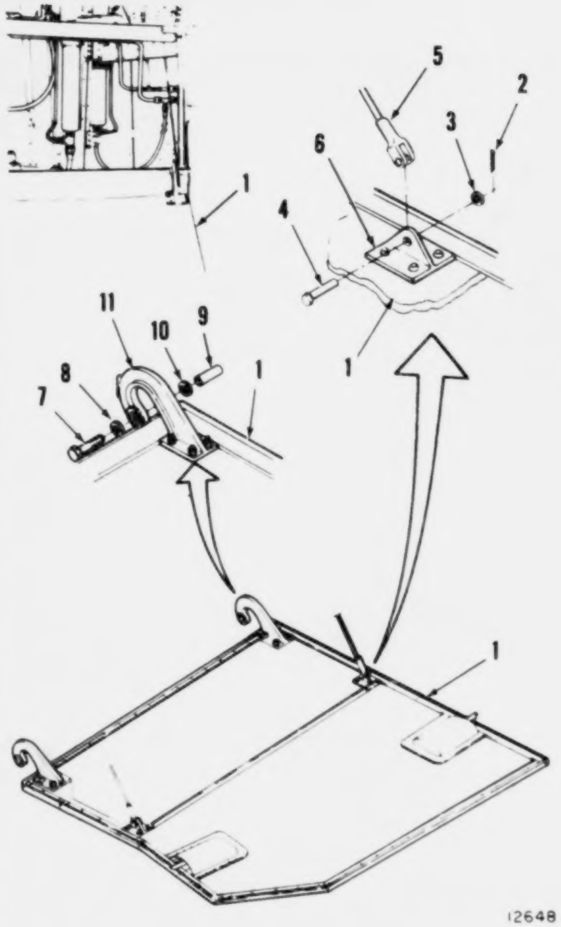
2-502.2. Repair of Composite Pylon Hinged Fairing (Work Platform).

a. Inspect the composite work platform to determine extent of damage. Repair includes the following procedures:

Surface Abrasion

Bond Void (To 2 Square Inches)

Bond Void (Over 2 Square Inches)



1. Work Platform
2. Cotter Pin
3. Washer
4. Pin
5. Cable
6. Bracket
7. Bolt
8. Washer
9. Bushing
10. Washer
11. Hinge Fitting

Figure 2-116.1. Removal of Composite Work Platform

Puncture Through One Skin and Core (To 1 Square Inch)

Puncture Through One Skin and Core (Over 1 Square Inch)

Puncture Through Both Skins and Core (To 1 Square Inch)

Puncture Through Both Skins and Core (Over 1 Square Inch)

b. (See fig. 2-116.2.) Do not make repairs within 2 inches of hinge fittings (1) platform brackets (2), or latch covers (3).

Procedure is same to repair left or right work platforms.

c. Surface Abrasion. (See fig. 2-116.2.)

(1) Outline area of damage with circle or oblong. Use pencil compass and straightedge.

(2) Cut a piece of fiberglass laminate (C141.2) large enough to overlap outline of damaged area by 1.0 inch in all directions.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(3) Remove finish down to primer from an area around damage 1.5 inches larger in all directions than damage. Use abrasive paper (C3.4). Use cloths (C104) damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

(4) Clean area of finish removal. Use clean cloth (C104) damp with acetone (C9). Wipe area dry with a clean cloth. Repeat until there is no residue on dry cloth.

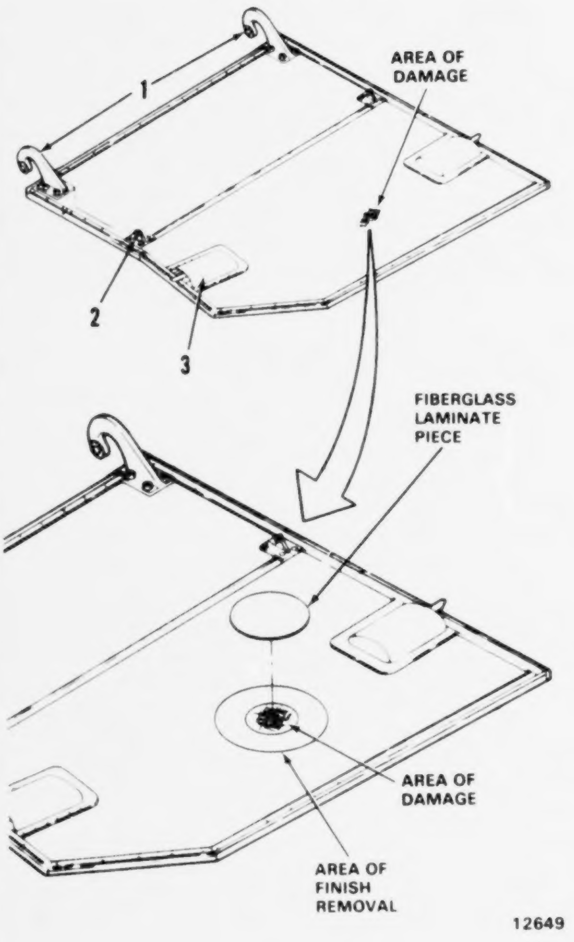
WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

(5) Prepare adhesive mixture. (Refer to step j.) Apply coat of adhesive to area of finish removal.

(6) Remove protective film from both sides of laminate piece. Carefully pull at right angle to direction of fibers.

(7) Apply coat of adhesive to underside of laminate piece. Center piece over damage and press down.


1
AREA OF DAMAGE
2
3
FIBERGLASS LAMINATE PIECE
AREA OF DAMAGE
AREA OF FINISH REMOVAL
12649

1. Hinge Fittings
2. Platform Brackets
3. Latch Covers

Figure 2-116.2. Repair of Surface Abrasion

(8) Bond and cure repair. (Refer to step k.)

d. Bond Void (To 2 Square Inches). (See fig. 2-116.3.)

(1) Determine extent of void by tapping area with coin. Outline area of void with circle or oblong. Use pencil compass and straightedge.

NOTE

If area of void is greater than 2 square inches, go to step e.

(2) Cut a piece of fiberglass laminate (C141.2) large enough to overlap outline of void by 1.0 inch in all directions.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(3) Remove finish down to primer from an area 1.5 inches larger in all directions than outline of void. Use abrasive paper (C3.4). Use cloths (C104) damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

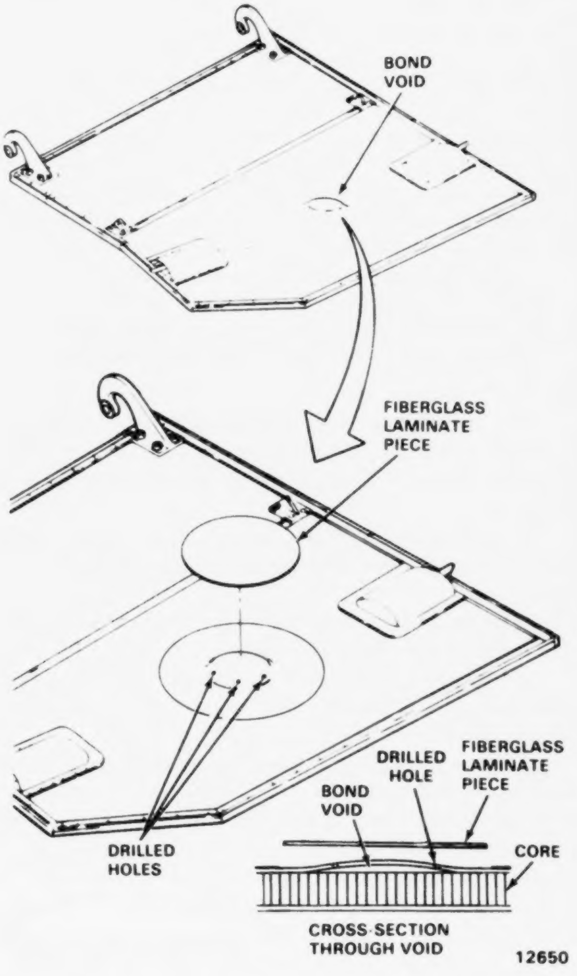

BOND VOID
FIBERGLASS LAMINATE PIECE
DRILLED HOLES
BOND VOID
DRILLED HOLE
FIBERGLASS LAMINATE PIECE
CORE
CROSS-SECTION THROUGH VOID
12650

Figure 2-116.3. Repair of Bond Void (To 2 Square Inches)

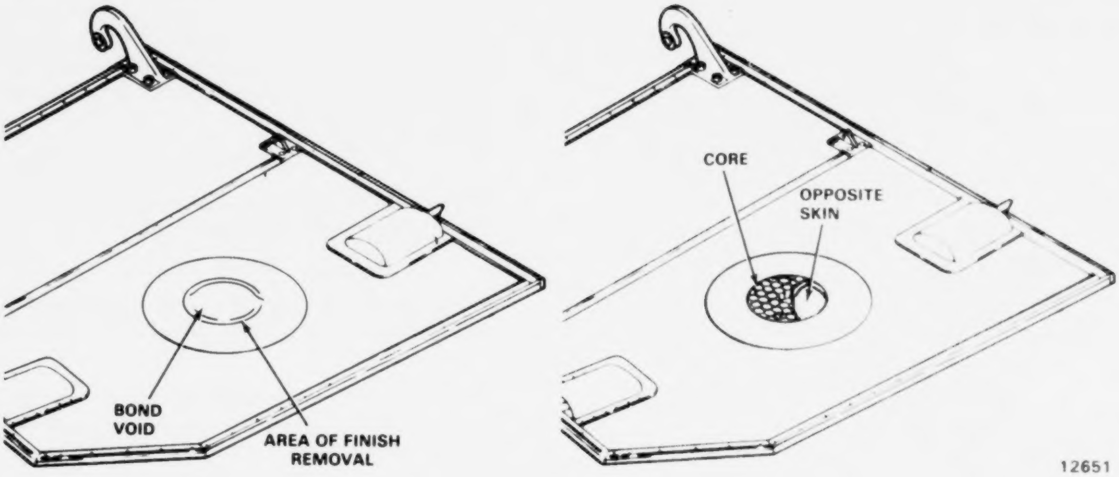


Figure 2-116.4. Preparation and Inspection for Bond Void Repair (Over 2 Square Inches)

(4) Drill several small holes through void near edge. Use a number 30 or 40 drill.

(5) Clean area with a clean cloth (C104) damp with acetone (C9). Wipe area dry with clean dry cloth.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

(6) Prepare mixture of adhesive. (Refer to step j.). Inject adhesive into void through holes until void and core under void are full. Use hypodermic syring (C331.2).

(7) Cover holes with tape (C338.1). Turn work platform over to prevent adhesive from running into core.

(8) Press down firmly on void. Let excess adhesive squeeze out through holes.

(9) Remove protective film from both sides of laminate piece. Carefully pull at right angle to direction of fibers.

(10) Apply coat of adhesive to underside of laminate piece and to repair area of platform within 1/2 inch of finish removal line. Center piece over void and press down.

(11) Bond and cure repair. (Refer to step k.).

e. Bond Void (Over 2 Square Inches).

(1) (See fig. 2-116.4.) Determine extent of void by tapping area with coin. Outline area of void with a circle or oblong. Use pencil compass or straightedge.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(2) Remove finish down to primer from an area 1.5 inches larger in all directions than outline. Use abrasive paper (C3.4). Use cloths (C104) damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

(3) Cut away unbonded skin. Use craftsman's knife.

(4) Examine exposed core material. If core is not damaged, clean the core and surrounding area with clean cloths (C104) damp with acetone (C9). Wipe dry with clean dry cloth. Go to step (10).

(5) If core is damaged, cut out core to layer of adhesive on opposite skin. Be careful not to damage skin. Use a chisel.

(6) Roughen surface of adhesive on opposite skin to remove gloss.

NOTE

Core material must be clean and dry for adhesive to hold.

(7) (See fig. 2-116.5.) Cut core plug in shape of cavity but 1/8 inch larger all around. Orient ribbon in same direction as existing core. Use core material (C121.7). Fit core plug into cavity to check fit.

(8) Remove core plug and clean cavity, surrounding area, and core plug. Use a vacuum cleaner and a clean cloth (C104) damp with acetone (C9). Wipe dry with a clean dry cloth. Repeat until there is no residue on dry cloth.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

(9) Prepare mixture of adhesive. (Refer to step j.) Apply coat of adhesive to sides and bottom of cavity. Apply coat of adhesive to sides and bottom of core plug. Set plug in cavity. Align matchmarks if applicable.

(10) Cut two pieces of fiberglass laminate (C141.2) to fit in cavity over core plug. Check that pieces fit flush with platform. Remove pieces.

(11) Remove protective film from both sides of two laminate pieces. Carefully pull at right angle to direction of fibers.

(12) Prepare mixture of adhesive. (Refer to step j.) Coat underside of one piece with adhesive. Press piece against core plug in cavity.

(13) Apply coat of adhesive to top of installed piece and underside of second piece. Install second piece in cavity over first piece. Press against piece to seat it flush with platform.

(14) (See fig. 2-116.6.) Cut three pieces of fiberglass laminate (C141.2). Make the smallest piece large enough to overlap core or laminate piece 1.0 inch in all directions. Make each additional piece large enough to overlap the previous piece 1 inch in all directions. If cutout is not circular, cut pieces so that fiber orientation between pieces will be 45 degrees when they are installed.

(15) Check that finish on platform is removed for at least 1/2 inch more in all directions than size of largest piece of laminate.

(16) Remove protective film from each side of three fiberglass laminate pieces. Carefully pull at right angle to direction of fibers.

NOTE

Laminate pieces must be installed so that fiber orientation between each of the three pieces will be 45 degrees.

(17) Apply adhesive to underside of laminate piece, top of installed piece, and to the surrounding area of platform to within 1/2 inch of finish removal line. Center smallest piece over repair area and press in place.

(18) Apply adhesive to top of installed piece and underside of next largest piece. Position larger piece on installed piece and press in place. Repeat procedure for third (largest) piece.

(19) Bond and cure repair. (Refer to step k.)

f. Puncture Through One Skin and Core (To 1 Square Inch). (See fig. 2-116.7.)

(1) Outline area of puncture with circle or oblong. Use pencil compass and straightedge.

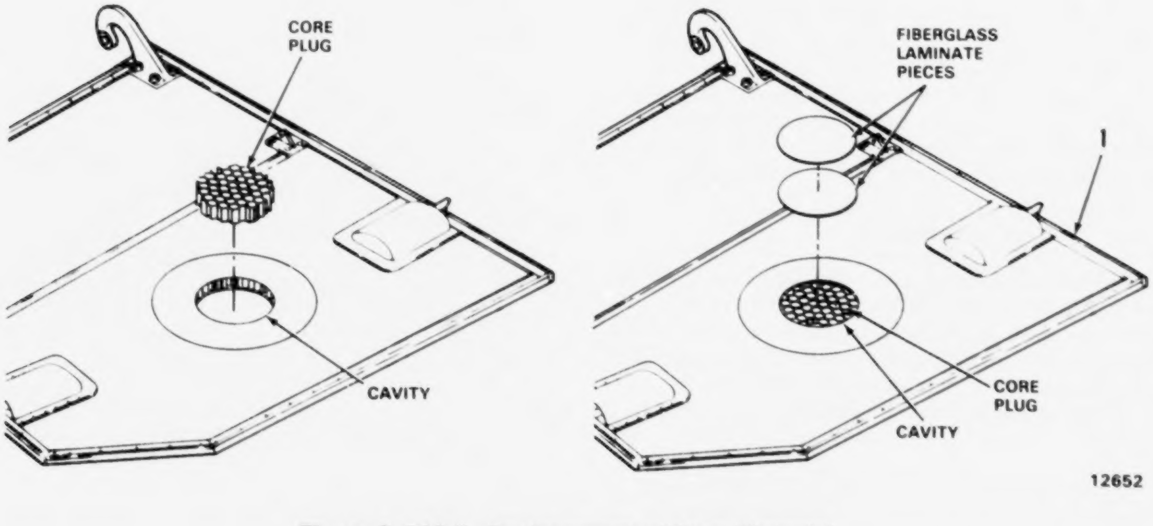


Figure 2-116.5. Replacement of Core Material (Bond Repair Over 2 Square Inches)

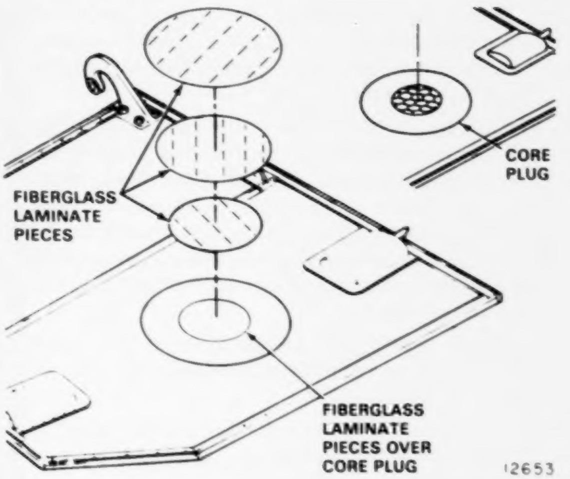


Figure 2-116.6. Reinforcement of Bond Void Repair (Bond Void Over 2 Square Inches)

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(2) Remove loose fragments and debris from area of puncture. Remove finish down to primer from an area 2.5 inches larger in all directions than outline around puncture. Use abrasive paper (C3.4). Use cloths (C104) damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

WARNING

Adhesives (C30.1 and 30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

(3) Prepare mixture of adhesive. (Refer to step j.) Fill puncture with adhesive mixture to surface of platform.

CAUTION

Do not heat platform surface over 160°F (71°C). Higher temperatures can damage cover.

(4) Cure adhesive at 140°F to 160°F (60°C to 71°C) for 2 hours. Use heat lamp. Monitor temperature with temperature indicating strips (C356.1).

NOTE

Serviceable cure can be achieved without heat at 70°F to 80°F (21°C to 71°C) in 24 hours.

(5) Fair cured adhesive to surface of platform. Use abrasive paper (C3.4). Clean area of finish removal. Use clean cloth (C104) damp with acetone (C9). Wipe area dry with clean dry cloth. Repeat until there is no residue on dry cloth.

(6) Cut three pieces of fiberglass laminate (C141.2). Make the smallest piece large enough to overlap filled puncture 1.0 inch in all directions. Make each additional piece large enough to overlap the previous piece 1 inch in all directions. If cutout is not circular, cut pieces so that fiber orientation between pieces will be 45 degrees when they are installed.

(7) Check that finish on platform is removed for at least 1/2 inch more in all directions than size of largest piece of laminate.

(8) Remove protective film from each side of three fiberglass laminate pieces. Carefully pull at right angle to direction of fibers.

NOTE

Laminate pieces must be installed so that fiber orientation between the two pieces will be 45 degrees when they are installed.

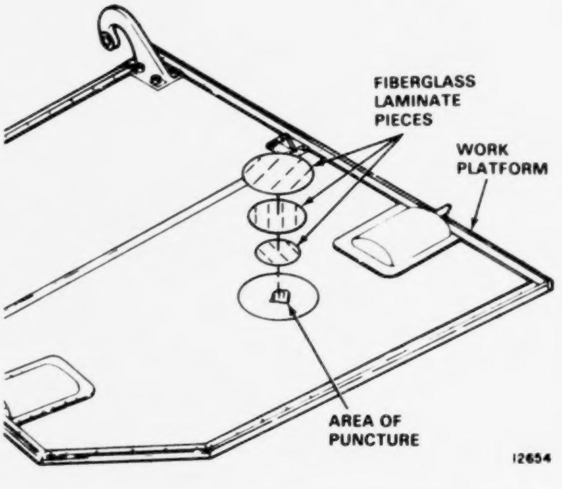


Figure 2-116.7. Repair of Puncture Through One Skin and Core (To 1 Square Inch)

(9) Apply adhesive to underside of smallest laminate piece, top of filled puncture, and to the surrounding area of platform to within 1/2 inch of finish removal line. Center smallest piece over repair area and press in place.

(10) Apply adhesive to top of installed piece and underside of next largest piece. Position second piece on installed piece and press in place. Repeat procedure for third (largest) piece.

(11) Bond and cure repair. (Refer to step k.)

g. Puncture Through One Skin and Core (Over 2 Square Inches).

(1) (See fig. 2-116.8.) Outline area of puncture with a circle or oblong. Use pencil compass and straightedge.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(2) Remove finish down to primer from an area 3.5 inches larger in all directions than outline. Use abrasive paper (C3.4). Use cloths (C104) damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

(3) Cut out punctured skin and core plug to layer of adhesive on opposite skin. Use craftsman's knife and chisel. Be careful not to damage skin.

(4) Roughen surface of adhesive on opposite skin to remove gloss.

(5) Complete repair with core plug and fiberglass laminate. (Refer to steps e.(7) through (24).

h. Puncture Through Both Skins and Core (Up To 2 Square Inches).

(1) (See fig. 2-116.9.) Outline area of puncture on both sides of platform with a circle or oblong. Use pencil compass and straightedge.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin,

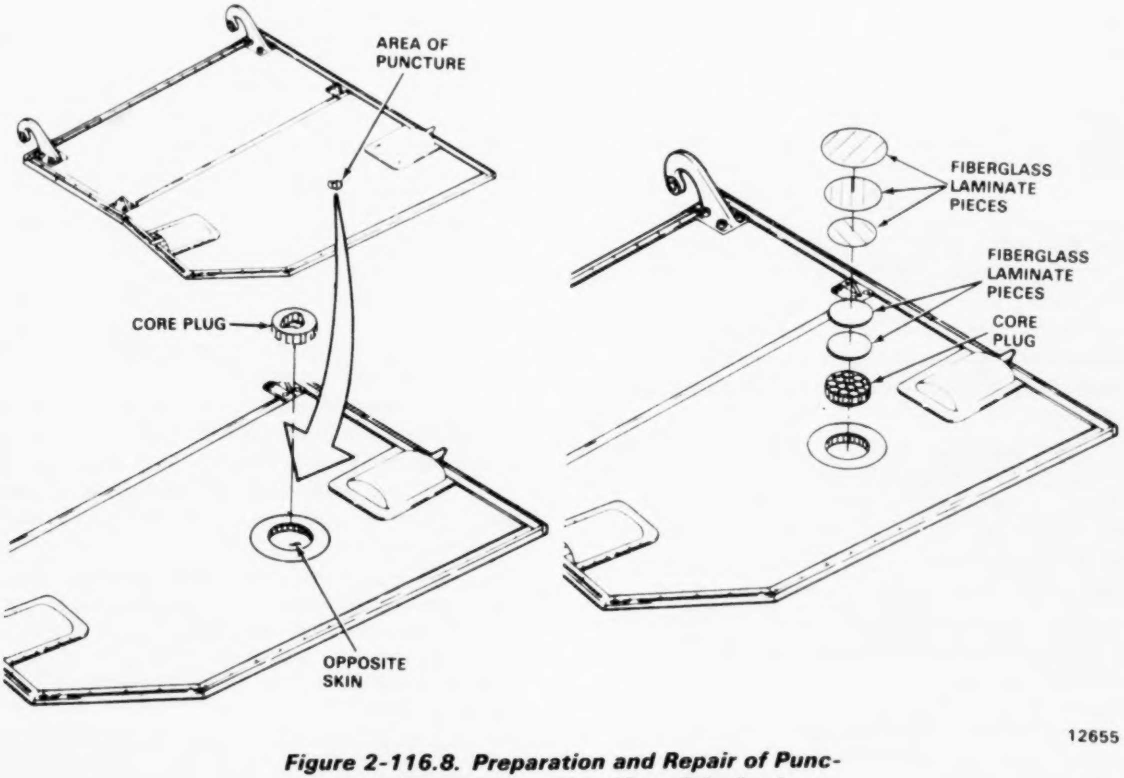


Figure 2-116.8. Preparation and Repair of Puncture Through One Skin (Over 2 Inches)

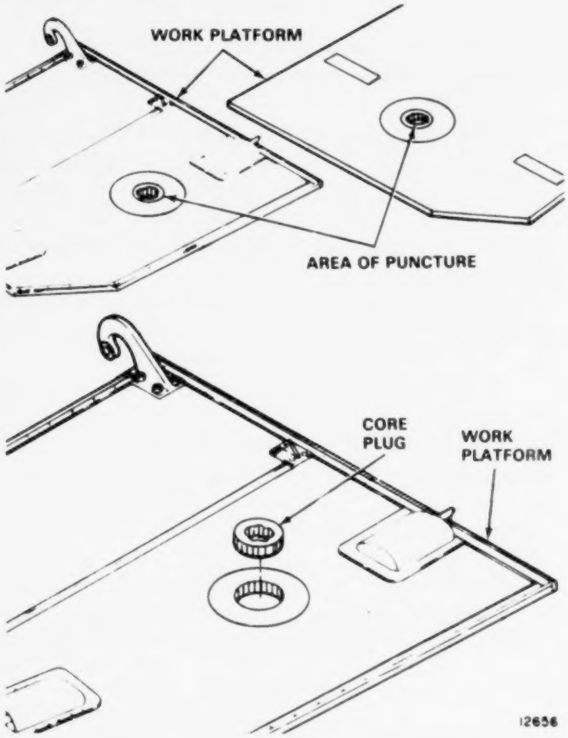


Figure 2-116.9. Preparation and Removal of Skin and Core Plug for Repair (Both Skins and Core up to 2 Square Inches)

eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(2) Remove finish down to primer from an area on both sides of platform 1.5 inches larger in all directions than outline. Use abrasive paper (C3.4). Use cloths damp with acetone (C9) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

(3) Cut out punctured skin and core plug. Work from both sides of platform as needed. Use craftsman's knife.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

(4) (See fig. 2-116.10.) Cover cutout on top of platform. Use nylon tape (C338.1).

(5) Prepare mixture of adhesive. (Refer to step j.). Fill cutout from bottom of platform to bottom surface with adhesive.

CAUTION

Do not heat platform surface over 160°F (71°C). Higher temperatures can damage platform.

(6) Cure adhesive at 140°F to 160°F (60°C to 71°C) for 2 hours. Use heat lamp. Monitor temperature with temperature indicating strips (C356.1).

NOTE

Serviceable cure can be achieved without heat at 70°F to 80°F (21°C to 27°C) in 24 hours.

(7) Remove tape. Fair cured adhesive to surface of platform on top and bottom. Use abrasive paper (C3.4).

(8) Clean area of finish removal on both sides of platform. Use clean cloths (C104) damp with acetone (C9). Wipe area dry with clean dry cloth. Repeat until there is no residue on dry cloth.

(9) Cut three pieces of fiberglass laminate (C141.2) for each side of platform. Make smallest piece large enough to overlap cured adhesive 1 inch in all directions. Make each additional piece large enough to overlap previous piece 1 inch in all directions. If cutout is not circular, cut pieces so that fiber orientation between pieces will be 45 degrees when they are installed.

(10) Prepare new mixture of adhesive. (Refer to step j.)

(11) Cover each side of puncture repair as follows:

(a) Apply a coat of adhesive to cured adhesive and area of finish removal.

(b) Remove protective film from each side of two fiberglass laminate pieces. Carefully pull at right angle to direction of fibers.

(c) Coat underside of smallest laminate piece with adhesive. Center piece over repair. Press down against platform.

(d) Apply adhesive over smallest installed piece and underside of next largest piece. Position next largest piece on installed piece so that fiber orientation between pieces is 45 degrees. Press down against installed piece. Repeat procedure for third (largest) piece.

(12) Bond and cure repair. (Refer to step k.)

i. Puncture Through Both Skins and Core (Over 1 Square Inch).

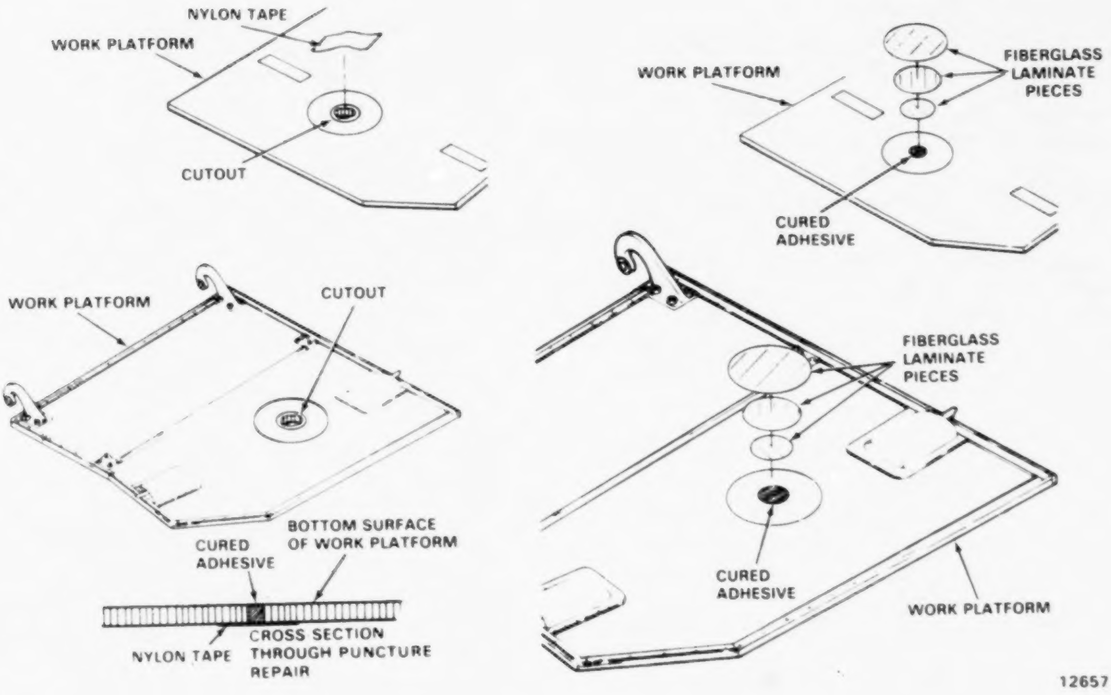

NYLON TAPE
WORK PLATFORM
CUTOUT
WORK PLATFORM
FIBERGLASS LAMINATE PIECES
CURED ADHESIVE
WORK PLATFORM
CUTOUT
FIBERGLASS LAMINATE PIECES
CURED ADHESIVE
BOTTOM SURFACE OF WORK PLATFORM
NYLON TAPE
CROSS SECTION THROUGH PUNCTURE REPAIR
CURED ADHESIVE
WORK PLATFORM
12657

Figure 2-116.10. Filling, Curing and Reinforcement of Repair

(1) (See fig. 2-116.11.) Outline area of puncture on both sides of platform with a circle or oblong. Use pencil compass and straightedge.

WARNING

Acetone (C9) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Do not sand into glass fibers. Complete removal of primer is not necessary.

NOTE

Gloves (C331.1) must be worn to protect skin and prevent contamination of bonding surfaces.

(2) Remove finish from an area on both sides of platform 3.5 inches larger in all directions than puncture outline. Use abrasive paper (C3.4). Use cloths damp with acetone (C104) as needed to soften finish. Wear gloves (C331.1). Wear gloves for the remaining steps of the repair installation.

(3) Cut out punctured skin and core plug. Work from both sides of platform as needed. Use craftsman's knife.

(4) Cut new core plug in shape of cutout but 1/8 inch larger all around. Orient ribbon in same direction as existing core. Use core material (C121.7). Fit core plug into cutout.

(5) (See fig. 2-116.12.) Cut two pieces of fiberglass laminate (C141.2) to fit cutout on both sides of platform. Check that pieces of laminate (C141.2) fit against installed core plug flush with platform on both sides. Remove laminate and plug

(6) Cut three pieces of fiberglass laminate (C141.2) for each side of platform. (Refer to para h.(8).)

(7) Clean cutout and surrounding area, core plug, and laminate. Use clean cloths (C104) damp with acetone (C9). Wipe dry with a clean dry cloth. Repeat until there is no residue on dry cloth.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

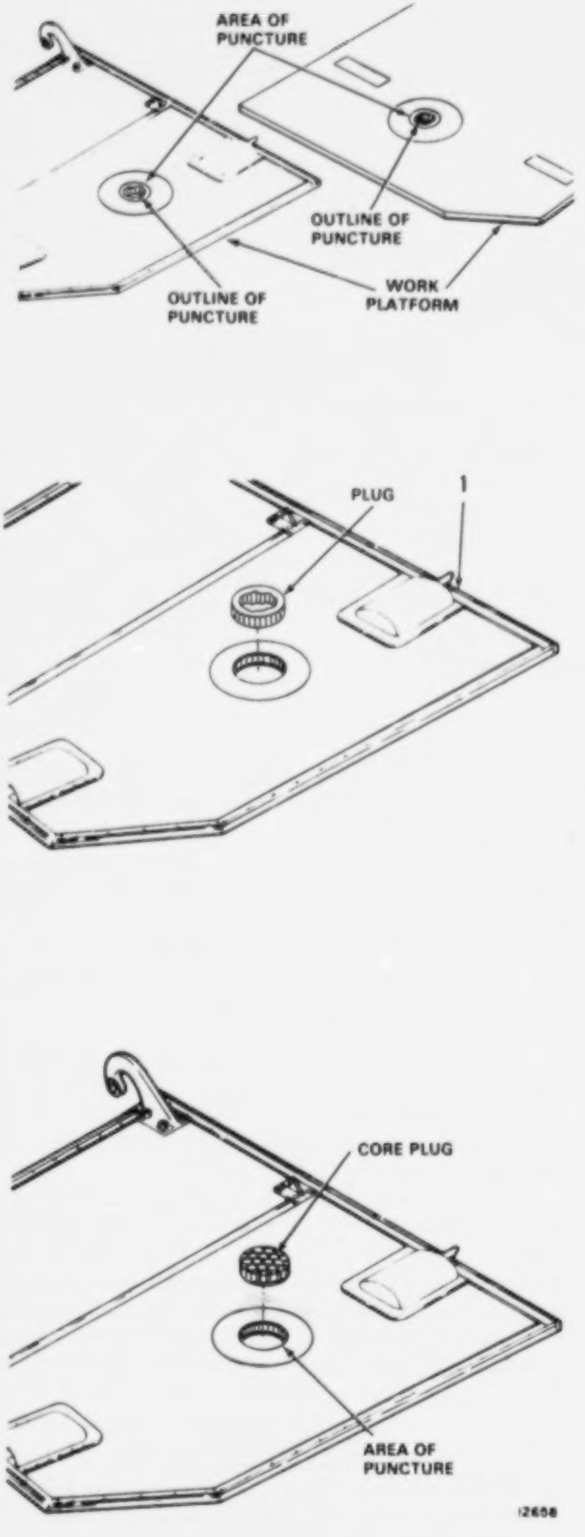

AREA OF PUNCTURE
OUTLINE OF PUNCTURE
OUTLINE OF PUNCTURE
WORK PLATFORM
PLUG
1
CORE PLUG
AREA OF PUNCTURE
12658

Figure 2-116.11. Preparation for Repair of Puncture Through Both Skins and Core (Over 1 Square Inch)

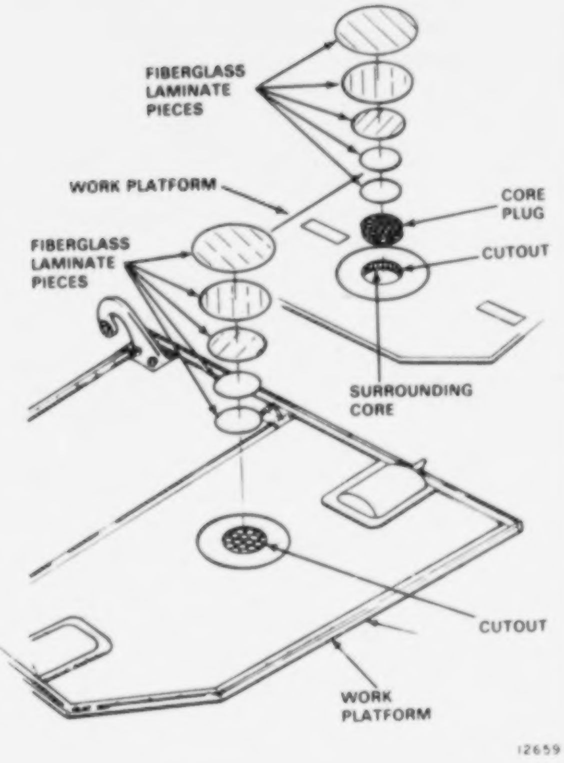

FIBERGLASS LAMINATE PIECES
WORK PLATFORM
CORE PLUG
CUTOUT
FIBERGLASS LAMINATE PIECES
SURROUNDING CORE
CUTOUT
WORK PLATFORM
12659

Figure 2-116.12. Preparations for Installing Fiberglass Laminate Pieces and Core Plug

(8) (See fig 2-116.13.) Prepare mixture of adhesive. (Refer to step j.) Apply coat of adhesive to sides of core plug. Set plug in cutout flush with surrounding core. Align matchmarks, if applicable.

(9) Install laminate pieces over core on each side of platform as follows:

(a) Remove protective film from each side of two fiberglass laminate pieces. Carefully pull at right angle to direction of fibers.

(b) Apply a coat of adhesive to underside of one piece. Press piece against plug.

(c) Apply coat of adhesive to top of installed piece and underside of second piece. Press against second piece to firmly seat flush with surrounding skin of platform.

(10) Cover each side of repair as follows:

(a) Apply coat of adhesive to top of laminate piece and to surrounding area of platform within 0.5 inch of finish removal line.

(b) Remove protective film from each side of three fiberglass laminate pieces. Carefully pull at right angle to direction of fibers.

NOTE

Laminate pieces must be installed so that fiber orientation between each of the three pieces will be at 45 degrees.

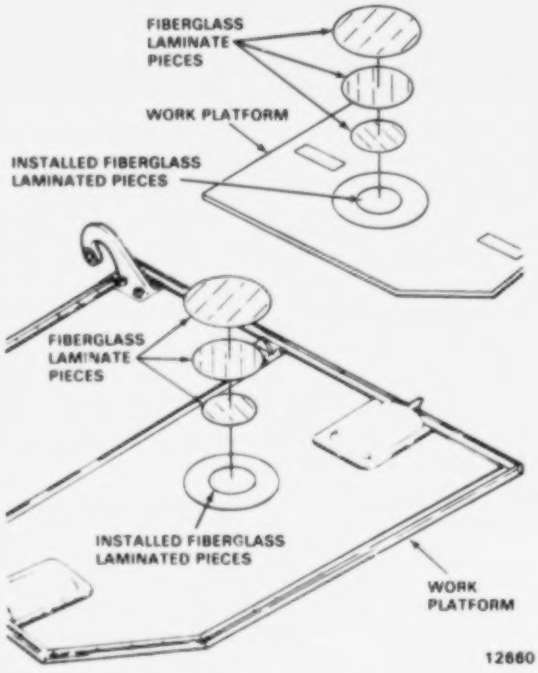

FIBERGLASS LAMINATE PIECES
WORK PLATFORM
INSTALLED FIBERGLASS LAMINATED PIECES
FIBERGLASS LAMINATE PIECES
INSTALLED FIBERGLASS LAMINATED PIECES
WORK PLATFORM
12660

Figure 2-116.13. Installing Fiberglass Laminate Pieces and Core

(c) Coat underside of smallest laminate piece with adhesive. Center piece over repair area and press in place.

(d) Apply coat of adhesive to top of installed piece and underside of next largest piece. Position larger piece on installed piece so that fiber orientation between pieces is 45 degrees. Press down against installed piece. Repeat procedure for third (largest) piece.

(11) Bond and cure repair. (Refer to step k.)

j. Adhesive Preparation.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Adhesive will cure in 2 hours at 150°F to 160°F (66°C to 71°C). A serviceable cure can be achieved at 70°F to 80°F (21°C to 27°C) in 24 hours. Pressure may be removed after 2 hours.

NOTE

Prepackaged adhesive (C30.1) is preferred. Use adhesive (C30.2) only if prepackaged kit is not available.

(1) Mix tube of adhesive EA9309.3NA (C30.1) according to instructions on kit.

(2) Prepare adhesive EA9309.3NA (C30.2) as follows:

(a) Weigh 100 parts of resin (pink paste) and 23 parts of hardener (blue liquid). Use trip balance.

(b) Mix parts in polyethylene cup (C128.1) until color is uniform dark pink. Use wood spatula (C364.1).

NOTE

Working life of adhesive (C30.2) is 30 minutes.

k. Bond and Cure Repair.

(1) (See fig. 2-116.14.) Cover repair part (1) with sheet of peel ply (C240.1) (2) and sheet of teflon-impregnated fabric (C142.1) (3). Each sheet shall be large enough to overlap repair 1 inch in all directions.

(2) Cover teflon-impregnated fabric (142.1) (3) with rubber pad (C285.1) (4). Cover rubber pad with glass cloth (C111.1) (5).

(3) Surround cloth (C111.1) (5) with border of sealing tape (C343.1) (6). Keep tape at least 1 inch outboard of cloth on all sides.

(4) Attach tube (7) to vacuum pump hose. Wrap end of tube with two layers of glass cloth (C111.1) (8). Secure cloth to tube with masking tape (C337) (9).

(5) Place tube (7) on glass cloth (C111.1) (5). Wrap tube with sealing tape (C343.1) (6) where tube crosses border of sealing tape (C343.1) (6).

(6) Press tube (7) against tape (6) to make an airtight seal. Check that glass cloth on end of tube (7) is in direct contact with layer of glass cloth (5).

(7) Cover area with nylon sheet (10). Press sheet smoothly against tape (6) to make an airtight seal.

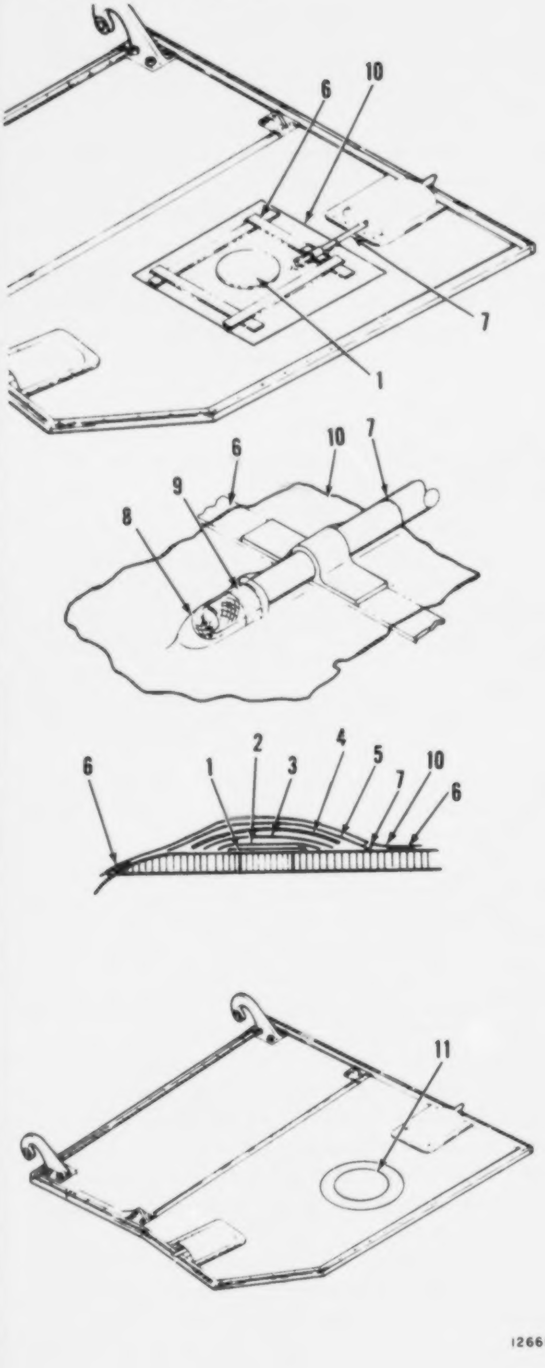
(8) Start vacuum pump. Set pump for vacuum of about 30 inches Hg.

(9) Shut off pump. Vacuum shall not drop more than 5 inches Hg in 5 minutes. Maintain vacuum of at least 20 inches Hg throughout adhesive cure.

(10) If need to maintain vacuum, shut down vacuum pump and reposition nylon sheet (10) or tape (6). Start pump.

WARNING

Adhesives (C30.1 and C30.2) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.



1. Repair Part
2. Peel Ply
3. Teflon Impregnated Fabric
4. Rubber Pad
5. Glass Cloth
6. Sealing Tape
7. Tube
8. Glass Cloth Wrap
9. Masking Tape
10. Nylon Sheet
11. Fiberglass Laminate Patch

Figure 2-116.14. Bond and Core Repair

CAUTION

Do not exceed 160°F (71°C) at surface of platform. Damage to platform can occur.

(11) Cure adhesive at 140°F to 160°F (60°C to 71°C) for 2 hours. Use heat lamp. Monitor temperature with temperature indicating strips (C356.1).

NOTE

Serviceable cure can be achieved without heat at 70°F to 80°F (21°C to 27°C) in 24 hours. Vacuum may be removed after 2 hours.

(12) Turn off vacuum pump. Remove vacuum bagging materials.

(13) Chamfer circumference of fiberglass laminate patch (11). Fair adhesive squeezeout to platform if needed. Use abrasive paper (C3.3).

2-502.3 Install Composite Pylon Hinged Fairing (Work Platform). (See fig. 2-116.1.)

NOTE

Procedure is same to install left and right work platform. Installation of left platform is shown here.

a. Position work platform (1) on pylon. Install bushing (9), washers (8), and bolt (7) through hinge fitting (11) and pylon on each side of platform. Lockwire bolt. Use lockwire (C206).

b. Install pin (4) through bracket (6) and support cable (5) on each side of platform (1). Install washer (3) and cotter pin (2). Close platform.

2-503. Leading-Edge Hinged Fairing.

(See fig. 2-117.) The fairing, located forward at sta 482, consists of lapped skins. The contour of the skins is maintained by formed sections and vertical stiffeners. The upper skin is cut out near the vertex and a screen 0.040-inch thick made of 2024-T4 aluminum alloy is installed.

The upper and lower latches are attached to the aft pylon leading edge hinged fairing (clamshell doors). When the latches are in the locked position, a center pin extends and engages with a plate secure to the other half of the clamshell doors.

2-504. Inspection. Inspect for nicks, dents, and scratches which can be removed by burnishing. Cracks, which have been stop-drilled, and small round or oval holes, not exceeding the limits shown in fig. 2-7 are permissible, for the skin, provided that they are temporarily covered with a patch. Inspect the pylon fairing latches for the following conditions:

a. Latches for positive locking.

b. Surrounding structure for cracks, distortion and corrosion.

c. Hardware for security.

2-505. Removal. (See fig. 2-118.)

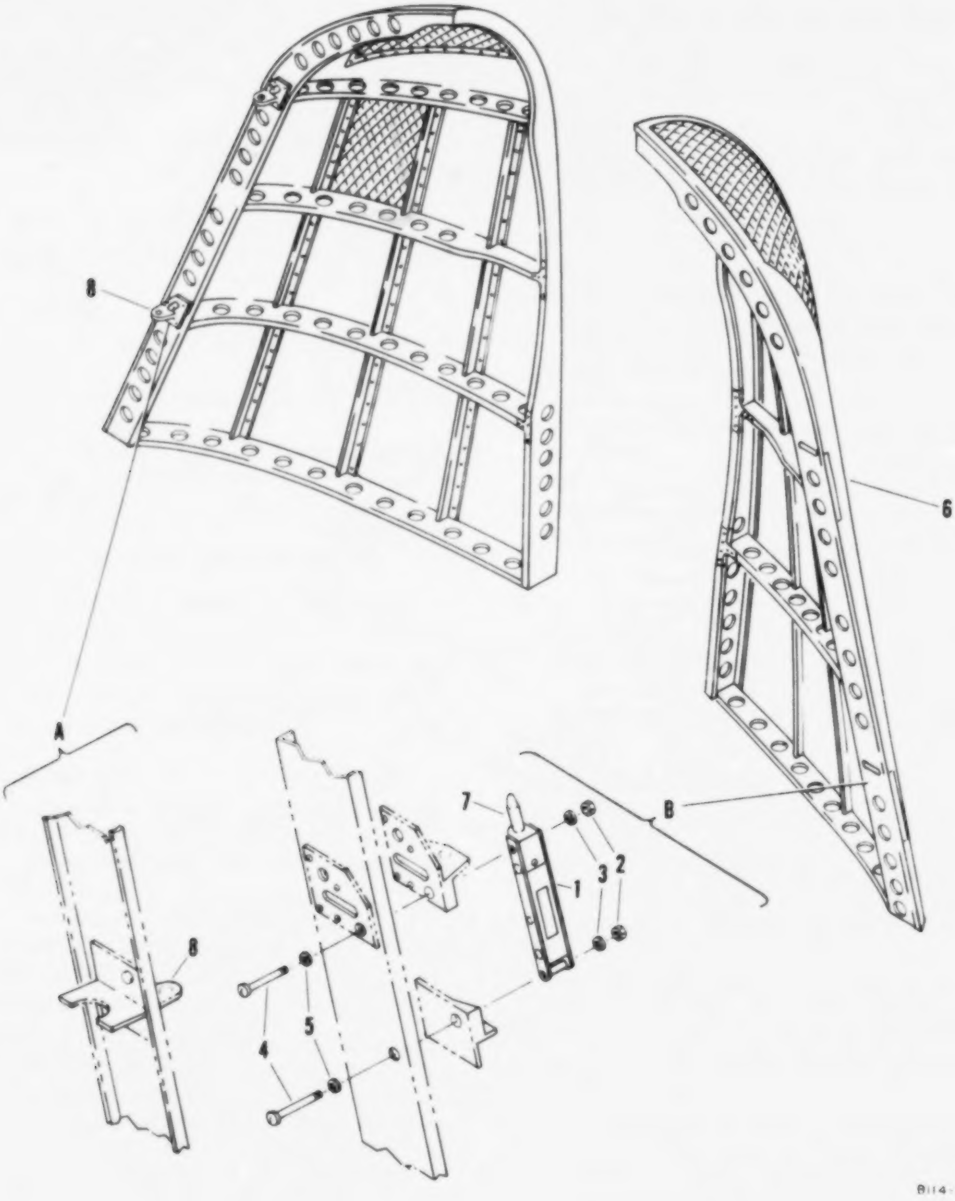
a. Release upper latch (1) and lower latch (2). Open hinged leading edge assembly (3) (clamshell doors).

b. Disconnect bonding wire from clamshell doors.

c. Support clamshell doors. Remove hinge pins (4). Remove clamshell doors.

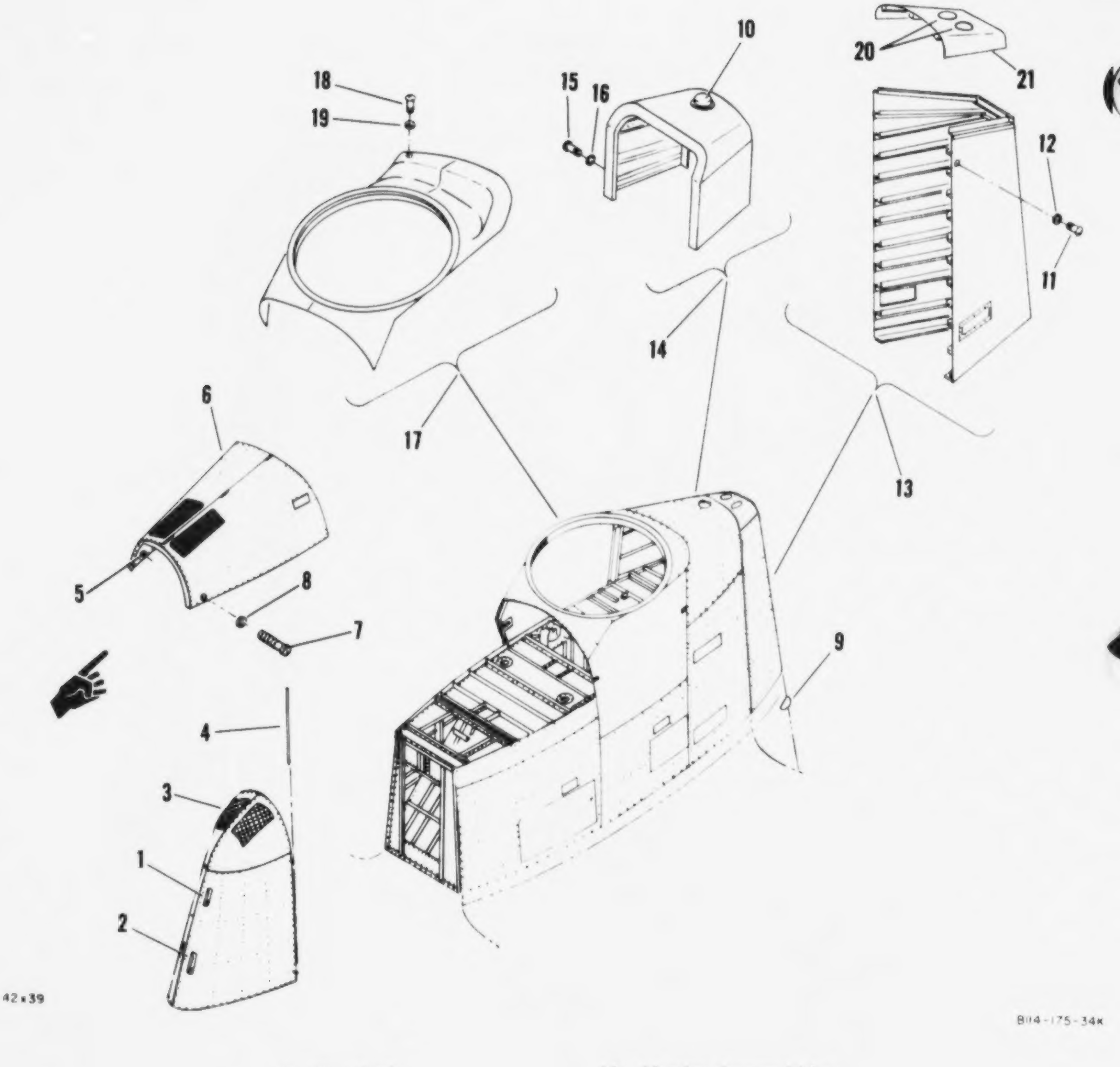
2-506. Repair. (See FO-7.)

a. Damage to the skins, affecting an area less than 25 percent of a skin panel, can be repaired by patching. Damage to the formed parts not affecting the radius can be


8
6
A
B
7
1
3
2
8
5
4
B114-336-20

1. Latch
2. Nut
3. Washer
4. Screw
5. Washer
6. Hinged fairing
7. Center pin
8. Securing plate

Figure 2-117. Aft Pylon Fairing Latches


10
20
21
18
15
16
19
12
11
14
6
17
13
5
8
7
9
4
3
1
2
42x39
B114-175-34X

1. Upper latch
2. Lower latch
3. Leading edge assembly
4. Hinge pin
5. Fastener
6. Forward crown fairing
7. Screw
8. Washer
9. Navigation light
10. Anticollision light
11. Screw
12. Washer
13. Blunt trailing edge assembly
14. Aft pylon aft crown fairing assembly
15. Screw
16. Washer
17. Aft pylon mid crown fairing assembly
18. Screw
19. Washer
20. Formation light
21. Blunt trailing edge assembly crown

Figure 2-118. Aft Pylon Hinged Leading Edge, Forward Crown Fairing, and Blunt Trailing Edge Assemblies

repaired by patching. Patch repairs are not applicable to the screen. Replace the screen with a corresponding section of screen (C237).

b. (AVIM). Damage affecting more than 25 percent of the area of a skin panel or which affects boundary members should be repaired by insertion. Damage to the formed parts, which affects a radius, should be repaired by insertion.

2-507. Replacement of Latches. (See fig. 2-117.)

a. Release the upper and lower latch (1). Open the pylon clamshell doors.

b. Remove the two nuts (2), washers (3), screws (4), and washers (5) securing the upper or lower latch to the door. Remove the latch.

To install the latches:

a. Align latch (1) with the pylon hinged fairing (6) (clamshell door).

b. Install screws (4) with washers (5) under the heads, washers (3), and the nuts (2).

c. With both the upper and lower latches installed, close the clamshell doors. Check that the latches lock the clamshell doors securely.

2-507.1. Repair of Leading Edge Fairing Latch.

a. If the turnlock stud is worn, remove grooved pin from shank of turnlock.

b. Replace turnlock and install a new grooved pin.

c. Insure pin extends approximately the same distance on each side of the turnlock shank.

2-508. Installation. (See fig. 2-118.)

a. Align hinge half of hinged leading edge assembly (clamshell door) with hinge half on aft pylon. Install hinge pins (4). Lockwire two hinge pin ends together. Use lockwire (C206).

b. Connect bonding wire to clamshell doors.

c. Close clamshell doors. Lock upper latch (1) and lower latch (2).

2-509. Forward Crown Fairing.

(See fig. 2-118.) The forward crown fairing is fitted to the aft pylon structure aft of the leading-edge hinge fairing, between sta 481.87 and 534. The fairing consists of two spotwelded skin assemblies, formers, stiffeners, webs, beams, and a curtain assembly. Both skin assemblies are fitted with a handhold and a screen. The right skin assembly is hinged to the top of the left assembly and is fitted with five latching assemblies and a strut assembly. The curtain assembly is made of webs and angles and is attached to the formers between sta 530 and 534.

2-510. Inspection. Inspect for nicks, dents, and scratches which can be removed by burnishing. Cracks, which have been stop-drilled, and small round or oval holes, not exceeding the limits shown in fig. 2-9, are permissible, for the skin, provided that they are temporarily covered with a patch. Any repairs must not interfere with the operation of the hinged right skin assembly.

2-511. Removal. (See fig. 2-118.)

a. Rotate fasteners (5) counterclockwise to unlocked position.

b. Disconnect bonding wire from forward crown fairing (6).

c. Remove screws (7) and washers (8) from forward crown fairing. Remove forward crown fairing.

2-512. Repair. (See FO-7.)

a. Damage to the skins, affecting an area less than 25 percent to the cross section of a skin panel, can be repaired by patching. Damage to formed parts not affecting the radius can be repaired by patching.

b. (AVIM). Damage affecting more than 25 percent of the cross section of a skin panel or which affects boundary members necessitates repair by insertion. Damage to formed parts, which affects a radius necessitates repair by insertion. Repairs to the strut are shown in fig. 2-17. See fig. 2-7 for repairs to the skins. See fig. 2-144 for repair of rubber seals. Patch and insertion repairs are not applicable to the screen.

2-513. Replacement of Screen. Replace the screen with a corresponding section of screen (C287).

2-514. Installation. (See fig. 2-118.)

a. Place forward crown fairing (6) in position on aft pylon. Align mounting holes. Install screws (7) and washers (8).

b. Connect bonding wire to forward crown fairing.

c. Close forward crown fairing. Turn fasteners (5) clockwise to locked position.

2-515. Midcrown Fairing.

(See fig. 2-118.) The midcrown fairing forms the fuselage contour around the aft transmission. The fairing consists of a lh and a rh assembly. A typical assembly is a section of molded, laminated, plastic-impregnated glass cloth to which are attached formed Z-sections of 2024-T4 clad aluminum alloy.

2-516. Inspection. Inspect for damage to metal parts which can be permitted to exist as is, or can be corrected by a simple procedure, such as the removal of a dent or a small damaged area and the stop-drilling of cracks.

2-517. Repair. (See FO-8.)

a. See fig. 2-3 for examples of damage to formed metal parts. Damage to the metal parts not affecting a radius can be repaired by patching. Damage to the impregnated glass cloth laminated skin which can be corrected by a simple procedure, such as stop-drilling cracks at each end of the crack and the removal of small damaged areas, without placing restrictions on flight is permissible. Temporary patching of cracks and small, trimmed, round or oval holes not exceeding the limits shown in fig. 2-6, sheet 3 is necessary and permissible.

b. (AVIM). Damage to metal parts that affects a radius should be repaired by insertion. See FO-8 for location of phase plate attaching hardware if repairs are made in that area.

2-518. Aft Crown Fairing.

(See fig. 2-118.) The fairing consists of skins riveted over formers. The skins are stiffened by extruded sections.

2-519. Inspection. Inspect for nicks, dents, and scratches which can be removed by burnishing. Skin cracks, which have been stop-drilled, and small round or oval holes, not exceeding the limits shown in fig. 2-7 are permissible, provided that they are temporarily covered with a patch.

2-520. Repair. (See FO-7.)

a. Damage to the skins, affecting an area less than 25 percent of the cross section of a skin panel, can be repaired by patching. Damage to formed parts not affecting the radius can be repaired by patching.

b. (AVIM). Damage affecting more than 25 percent of the cross section of a skin panel or which affects boundary members necessitates repair by insertion. Damage to formed parts which affects a radius necessitates repair by insertion.

2-521. Trailing Edge Fairing.

(See fig. 2-118.) The trailing edge fairing is composed of impregnated glass cloth skins stiffened longitudinally by formers of the same material. Vertical members consisting of cellulose acetate foam, covered with impregnated glass cloth, also serve to stiffen the skin. A former is the main structural member and attaches the fairing at sta 594.

2-522. Inspection. Inspect for damage to the metal parts which can be permitted to exist as is, or can be corrected by a simple procedure, such as removal of a dent or a small damaged area and the stop-drilling of cracks.

2-523. Removal. (See fig. 2-118.)

a. Install maintenance crane (T5). (Refer to para 1-103.)

b. Remove navigation light (9) and disconnect electrical wiring.

c. Disconnect electrical wiring from anticollision light (10) and formation lights (20). Gain access thru aft pylon work platform area.

d. Attach a rope or cable to blunt trailing edge. Secure maintenance crane hook to rope or cable.

e. Remove screws (11) and washers (12) from blunt trailing edge assembly (13). Remove the blunt trailing edge assembly.

2-524. Repair. (See FO-7.)

a. Damage to the metal parts not affecting a radius can be repaired by patching. See fig. 2-3 for examples of damage to formed metal parts. Damage to the impregnated glass cloth laminated skin which can be corrected by a simple procedure, such as stop-drilling cracks at each end of the crack and the removal of small damaged areas, without placing restrictions on flight is permissible. Temporary patching of cracks and small, trimmed, round or oval holes not exceeding the limits shown in fig. 2-6, sheet 3 is necessary and permissible.

b. (AVIM). Damage to metal parts that affects a radius should be repaired by insertion.

2-525. Installation. (See fig. 2-118.)

a. Attach a rope or cable to blunt trailing edge. Secure the maintenance crane (T5) hook to the rope or cable.

b. Lift blunt trailing edge assembly (13) in position on aft pylon. Make sure wire for navigation light (9) protrudes through mounting hole. Align pylon mounting holes. Install screws (11) and washers (12). Disconnect rope or cable from blunt trailing edge.

c. Connect electrical wiring to anticollision light (10) and formation light (20). Gain access thru aft pylon work platform area.

d. Connect electrical wiring to navigation light (9). Install navigation light.

e. Remove maintenance crane from helicopter. (Refer to para 1-104.)

2-526. Aft Pylon Equipment Support Structures.

The equipment support structures, in the aft pylon structure assembly, consist of the aft trunion actuator forward and aft supports, aft swiveling actuator support, transmission oil cooling fan support, and aft bellcrank left and right supports. The aft trunnion actuator supports are made of aluminum alloy to which reinforcing members are attached. The aft swiveling actuator support consists of a web made of aluminum alloy, reinforced with a formed aluminum alloy cap and extruded aluminum alloy stiffeners. The transmission oil cooling fan support consists of two aluminum alloy webs to which are attached formed aluminum alloy angles and Z-sections. Fittings are provided for installation of the actuators and transmission oil cooling fan.

2-527. Inspection. Oilcanning of the blower support webs which does not exceed ¼ inch (depression or elevation) is permissible without repair. Damage to fittings shall be limited to nicks and scratches whose depth is not to exceed 10 percent of the thickness of the material after burnishing. Damage shall clear all bolts, rivets, and radiuses a minimum of ¾ inch.

2-528. Repair. (See fig. 2-119.) Repair damaged equipment support structure as directed in subsequent paragraphs.

WARNING

> The support assembly 114S4111-35 for the aft pivoting actuator consists of a trunnion fitting and an aft support fitting. If repair necessitates replacement of the trunnion fitting, use only the forged trunnion fitting 114S4811-5.

a. Damage to webs can be repaired by patching, provided damage does not exceed 25 percent of the cross section between attaching members and clears members sufficiently to allow proper rivet spacing. Refer to para 2-635 for information on repair of oilcanning if negligible limits are exceeded.

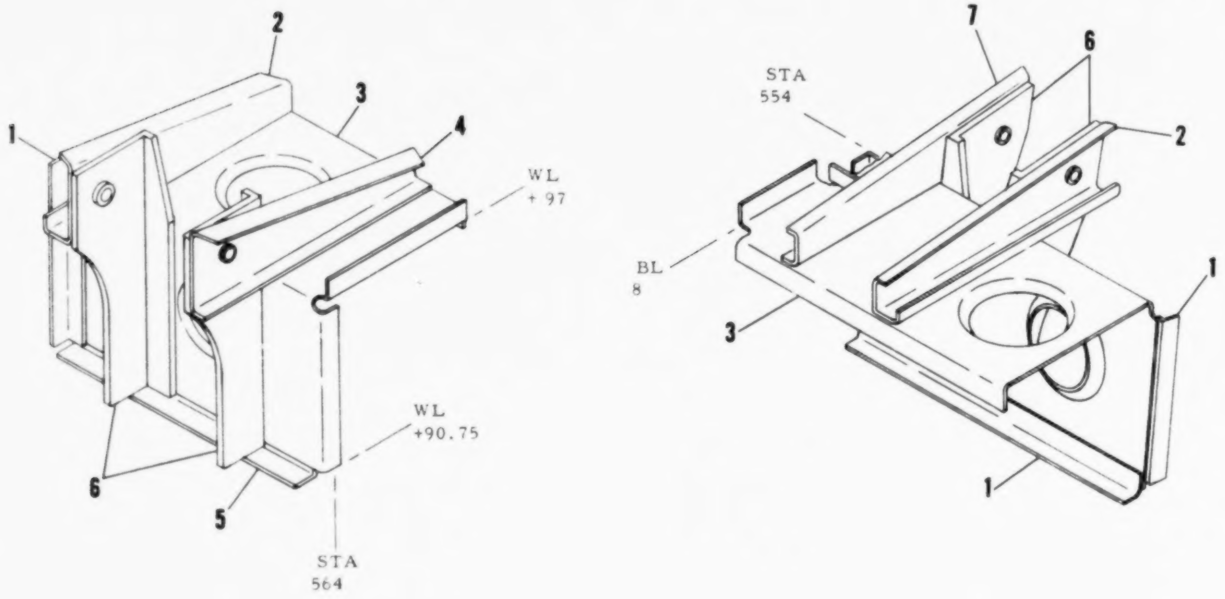
b. (AVIM). Damage which exceeds limits for patching and which is not extensive should be repaired by insertion. See fig. 2-7 for typical repairs to webs.

c. (AVIM). Repair gouges and wear steps on aft swiveling support mount as follows:

(1) Blend gouges within limits shown in fig. 2-119. Use crocus cloth (C106). Remove least amount of material possible to remove and blend damage.

(2) Penetrant inspect reworked lugs for cracks in accordance with MIL-I-6866. Pay particular attention to the radiuses at the base of the lugs (area A) and also to the lug bore surfaces and surrounding areas.

AFT BELLCRANK SUPPORTS--LEFT AND RIGHT HAND



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
2	CHANNEL	0.050 7075-T6 BARE	0.050 7075-T6 CLAD
3	SUPPORT	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
4	CHANNEL	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
5	ANGLE	ALCOA 22509 7075-T6	0.050 4130
6	ANGLE	REYNOLDS 26807 7075-T6	0.125 4130
7	△ CHANNEL	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
	□ CHANNEL	0.032 301 CRES 1/2H	0.040 301 CRES 1/2H

△ USED ON HELICOPTERS 66-19098 THROUGH 67-18521
□ USED ON HELICOPTERS 67-18522 AND SUBSEQUENT

NOTE

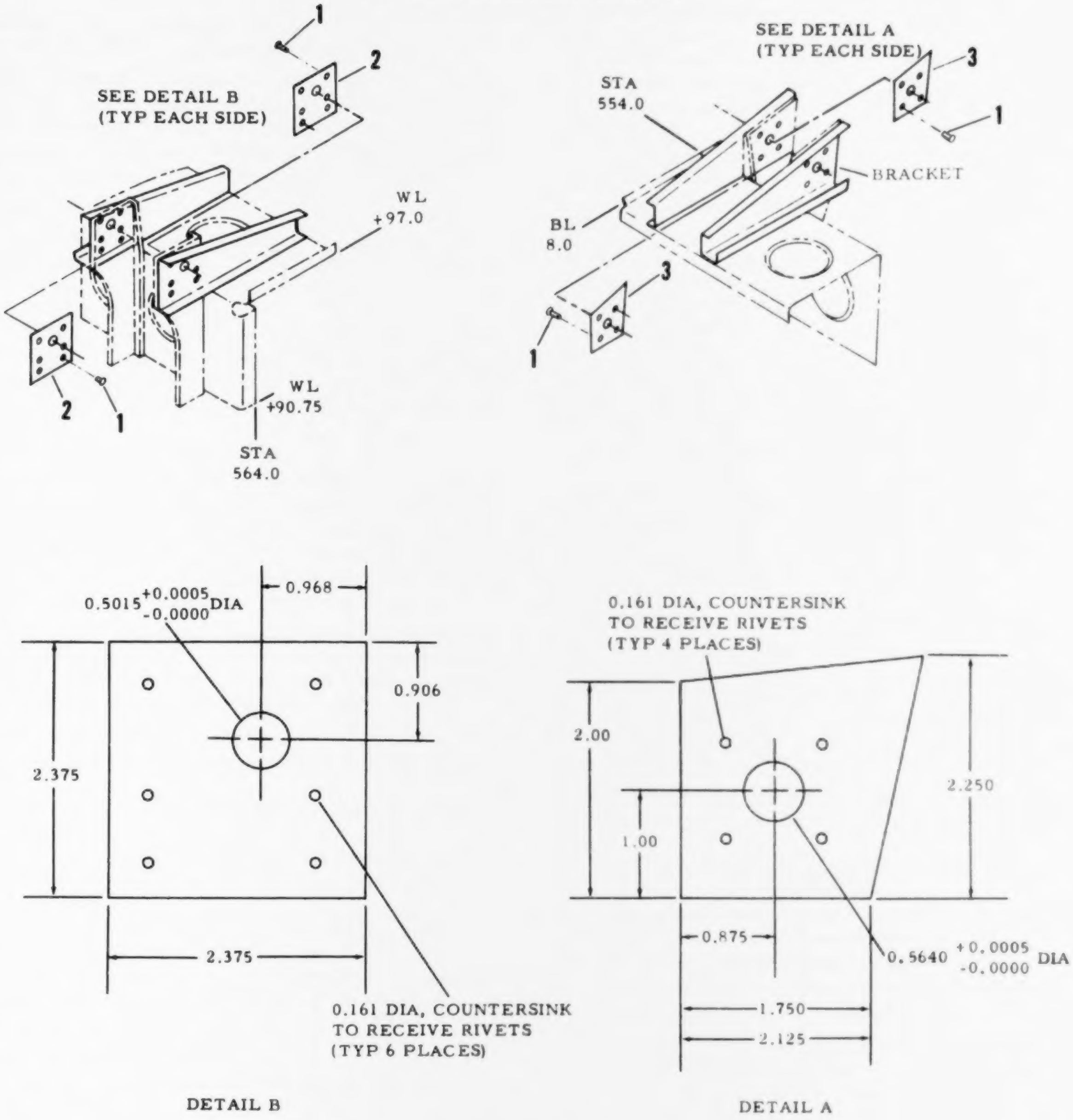
ALL DIMENSIONS ARE IN INCHES

42x51

B114-259-345V

Figure 2-119. Equipment Support Structure Repairs—Aft Pylon Structure Assembly (Sheet 1 of 4)

REPAIR FOR ELONGATED HOLES


1
2
SEE DETAIL B
(TYP EACH SIDE)
WL
+97.0
2
1
WL
+90.75
STA
564.0
SEE DETAIL A
(TYP EACH SIDE)
3
STA
554.0
1
BRACKET
BL
8.0
3
1
0.5015 +0.0005 -0.0000 DIA
0.968
0.906
2.375
2.375
0.161 DIA, COUNTERSINK
TO RECEIVE RIVETS
(TYP 6 PLACES)
DETAIL B
0.161 DIA, COUNTERSINK
TO RECEIVE RIVETS
(TYP 4 PLACES)
2.00
2.250
1.00
0.875
0.5640 +0.0005 -0.0000 DIA
1.750
2.125
DETAIL A

REPAIR PARTS

1. RIVET MS20426AD5, LENGTH AS REQUIRED
2. DOUBLER 0.020, 301 CRES 1/4 TO 1/2 HARD
3. DOUBLER 0.020, 301 CRES 1/4 TO 1/2 HARD

NOTE

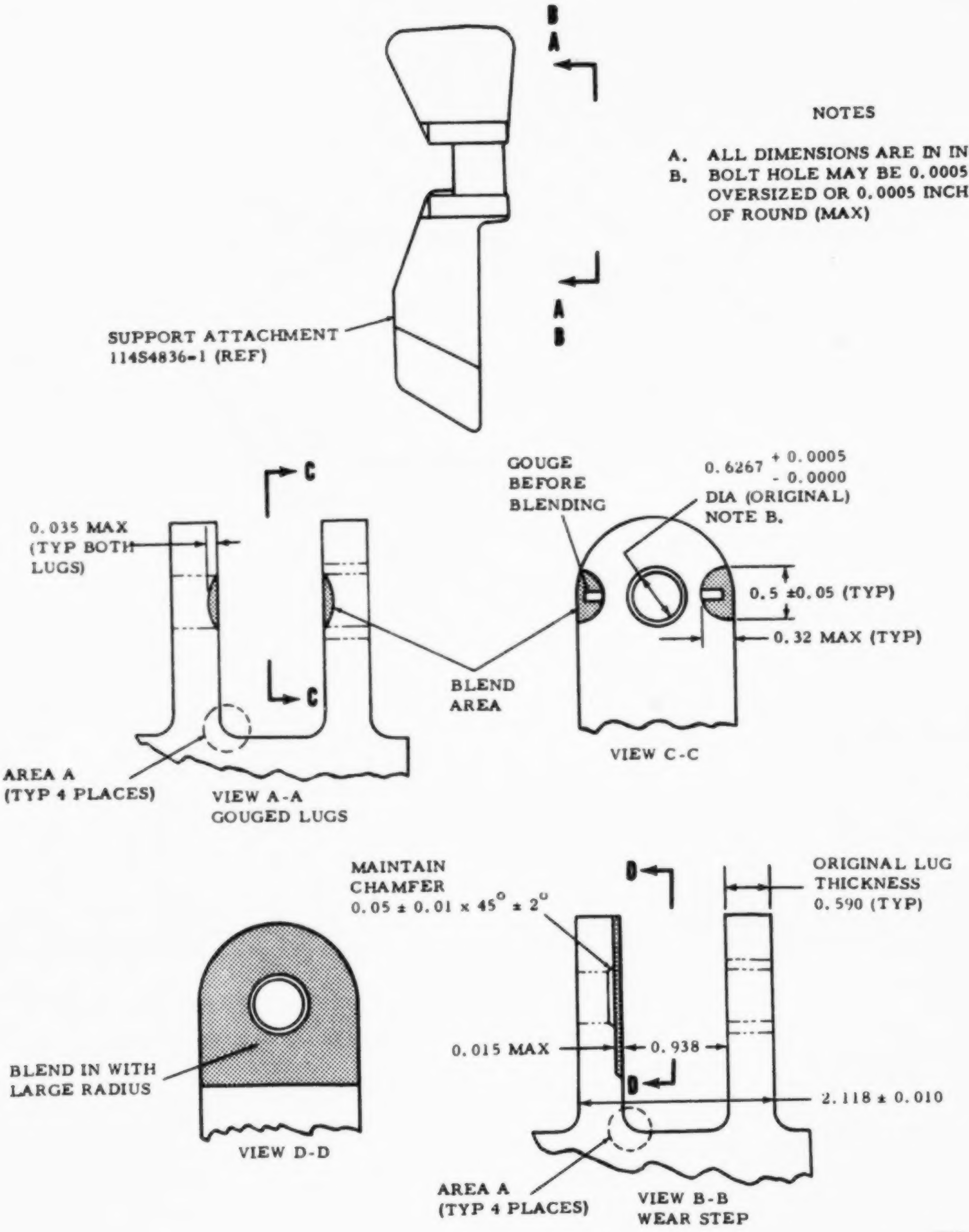
ALL DIMENSIONS ARE IN INCHES

42 x 50

B114-278-34SJ

Figure 2-119. Equipment Support Structure Repairs—Aft Pylon Structure Assembly (Sheet 2 of 4)

AFT SWIVELING ACTUATOR SUPPORT

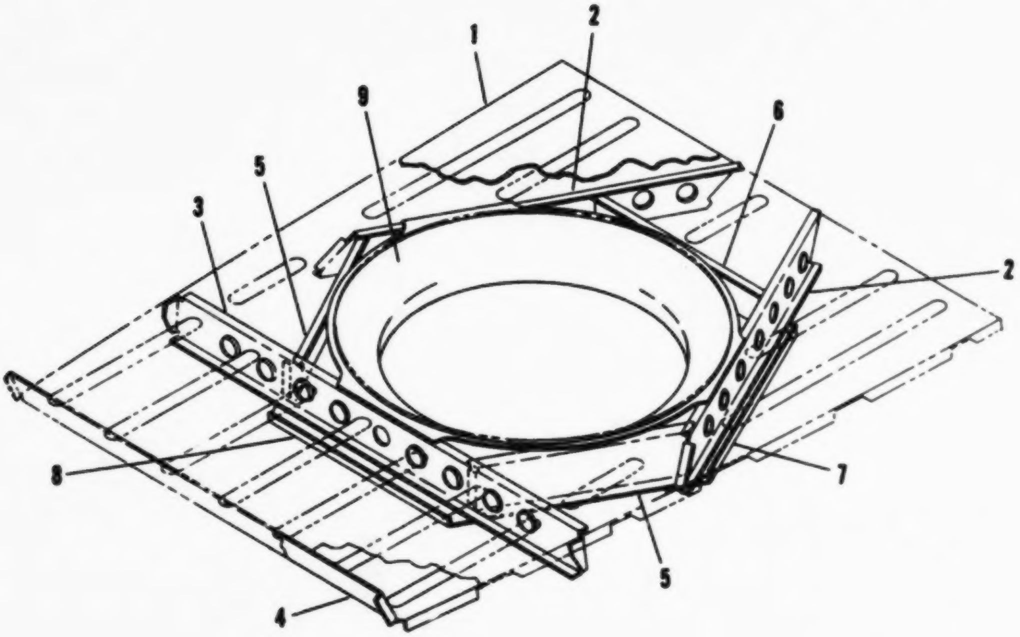

B
A
A
B
SUPPORT ATTACHMENT
114S4836-1 (REF)
C
C
0.035 MAX
(TYP BOTH LUGS)
GOUGE
BEFORE
BLENDING
0.6267 + 0.0005 - 0.0000
DIA (ORIGINAL)
NOTE B.
0.5 ±0.05 (TYP)
0.32 MAX (TYP)
BLEND
AREA
AREA A
(TYP 4 PLACES)
VIEW A-A
GOUGED LUGS
VIEW C-C
MAINTAIN
CHAMFER
0.05 ± 0.01 x 45° ± 2°
D
D
ORIGINAL LUG
THICKNESS
0.590 (TYP)
BLEND IN WITH
LARGE RADIUS
0.015 MAX
0.938
2.118 ± 0.010
VIEW D-D
AREA A
(TYP 4 PLACES)
VIEW B-B
WEAR STEP
42x51
8114-603-345Q

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. BOLT HOLE MAY BE 0.0005 INCH OVERSIZED OR 0.0005 INCH OUT OF ROUND (MAX)

Figure 2-119. Equipment Support Structure Repairs—Aft Pylon Structure Assembly (Sheet 3 of 4)

BLOWER SUPPORT STRUCTURE



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	2-7
2	ZEE	0.025 7075-T6 BARE	0.032 7075-T6 CLAD	--
3	ZEE	0.032 7075-T6 BARE	0.040 7075-T6 CLAD	--
4	WEB	0.020 7075-T6 BARE	0.025 7075-T6 CLAD	2-7
5	ZEE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
6	ZEE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
7	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
8	ANGLE	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
9	BELLMOUTH	0.080 6061-T6 BARE	0.090 6061-T6 CLAD	2-7

NOTE

ALL DIMENSIONS ARE IN INCHES

42x47

B114-260-345V

Figure 2-119. Equipment Support Structure Repairs—Aft Pylon Structure Assembly (Sheet 4 of 4)

ALL DATA ON PAGES 2-335 THROUGH 2-341, INCLUDING FIGURES 2-120 THROUGH 2-124, DELETED.

SECTION IV WING
(Not Applicable)

SECTION V GENERAL REPAIR INFORMATION

2-535. General.

This section contains repair procedures and general information on adhesive bonding, application of tapes, application of fillers, cleaning, and removal of finishes, corrosion treatment and prevention, plating and finish coatings, repair of impregnated glass cloth parts, repair of extrusions, repair of thermoplastic parts, fuselage sealing, hardware, sandwich honeycomb repairs, and typical repairs. Reference to specific paragraph or figure numbers in this section is made throughout the manual when applicable. Table 2-14 lists the location of repair procedures and the general information contained in this section.

2-536. Adhesive Bonding.

Subsequent paragraphs contain procedures for the mixing and application of bonding agents. These procedures should be used only when referenced in this manual. For non-critical applications the procedures may be used without specific reference. To obtain optimum benefit from the information and tables, select the proper adhesive as follows:

a. Determine the type of material to be bonded. Table 2-15 cross-references trade names to the type of material.

b. Determine the appropriate adhesive systems by matching materials in table 2-16. An adhesive system may include more than one type of adhesive, since several adhesives may be identical in physical properties and use.

c. Determine which adhesive system is most suitable. Table 2-17 lists the criteria for each system.

d. Select the adhesive. Table 2-18 lists the adhesive system numbers and the corresponding acceptable adhesives. Refer to the paragraph number given in the column APPLICATION AND CURE for the acceptable method of bonding.

2-537. Adhesive Systems Application Criteria.

This information is applicable to all adhesives and must be strictly followed.

a. If the adhesive or individual components of adhesive have been stored under refrigeration, allow adhesive or components to reach 70°F (21°C), prior to blending or use.

NOTE

High temperatures and humidity shorten pot life of adhesives, low temperatures will lengthen it.

b. No addition or omission of ingredients, or deviation from mixing or blending procedures is permitted.

c. Thinning of adhesives is not permitted unless specifically allowed in the procedure.

d. All multiple-part adhesives must be blended by weight, within 2½ percent.

e. All multiple-part adhesives must be blended in clean, metal, glass, polyethylene, or Teflon containers only.

2-538. Preparation of Bonding Surfaces.

Unless otherwise spacified, all bonding surfaces except thermoplastic, phenolic, and melamine, must be thoroughly cleaned using clean cloths (C104) moist with methyl-ethyl-ketone (C216). Thermoplastic, phenolic, and melamine must be lightly sanded to remove gloss and then cleaned with aliphatic naphtha (C217).

2-539. Adhesive System Application.

The several methods of adhesive system application are described in the following paragraphs. All adhesives discussed are either toxic, flammable, or irritating to the skin. Be careful when mixing or using.

2-540. Application of Adhesive, System No. 1.

WARNING

The adhesives under this system are toxic and flammable. Work in well-ventilated areas away from flame.

NOTE

The acceptable adhesives under this system replace cements EC-711, EC-847, EC-870, and EC-826 (items C33, C35, C36 and C87). Existing stocks of these replaced cements may be used until depletion. Refer to table 2-18 for the list of acceptable adhesives.

a. (Refer to table 2-18.) Clean the faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly stir adhesive in its own container using a spatula.

NOTE

If adhesive is to be applied by spraying, it may be thinned with methyl-ethyl-ketone (C216).

c. Brush or spray one coat of the adhesive on each faying surface.

NOTE

On porous surfaces such as textiles and wood, two coats must be applied. The first coat must seal the surface and be completely dry before application of the second coat.

d. Allow adhesive to dry until tacky, then join surfaces. Apply sufficient pressure to ensure solid contact.

NOTE

The assembled parts may be handled immediately. However, maximum strength is achieved after 7 days at 70°F (21°C). At 200°F (93°C), curing takes 1 to 6 hours.

Table 2-14. Repair Procedures and General Information Reference

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Acid/alkaline protection	2-624		
Adhesive bonding	2-536		
Adhesive system selection			2-16 and 2-18
Adhesive system No. 1, application of	2-540		
Adhesive system No. 2, application of	2-541		
Adhesive system No. 3, application of	2-542		
Adhesive system No. 4, application of	2-543		
Adhesive system No. 5, application of	2-544		
Adhesive system No. 6, application of	2-545		
Adhesive system No. 7, application of	2-546		
Adhesive system No. 8, application of	2-547		
Adhesive system No. 9, application of (option 1)	2-548		
Adhesive system No. 9, application of (option 2)	2-549		
Adhesive system No. 10, application of	2-550		
Adhesive system No. 11, application of	2-551		
Adhesive system No. 12, application of	2-552		
Adhesive system No. 13, application of	2-553		
Adhesive system criteria			2-17
Aluminum tubing repair	2-655		
Antichafing tape, application of	2-586		
Antichafing tape, removal of	2-587		
Bolt hole criteria	2-575		
Bolts, AN, substitution for AN rivets	2-568		2-20
Bolts, An, substitution for screws	2-574		
Bolts and screws, size information table			2-23
Bolts, NAS, substitution for	2-570		
Bonding surfaces, preparation of	2-538		
Brass, surface treatment of	2-614		
Bronze, surface treatment of	2-614		
Bushings, oversize	2-578		
Bushings, plain	2-579		
Bushings, shouldered	2-580		
Bushings, standard	2-577		
Canvas and webbing repair	2-654	2-42	
Carbon steels, surface treatment of	2-613		
Circular cutout repair, lightly-stressed areas		2-7	
Cleaning and treating corroded parts			2-24
Copper, surface treatment of	2-614		
Corfil 615, application of	2-590		
Corroded parts, cleaning and treating	2-602		
Corrosion	2-595		
Corrosion, electrolytic	2-597		
Corrosion, hydroscopic material	2-600		
Corrosion, stress	2-599		
Corrosion, superficial	2-596		
Cotter pins	2-576		
Cotton cloth repair to skin and web		2-7	
Damage repair, impregnated glass cloth	2-628		
Decal overcoating	2-625		
Delron fasteners, installation of	2-581		
Delron fasteners, removal of	2-581		
Edge distance, riveting		2-127	
Extrusions	2-582	2-128	
Fillers, application of	2-589		
Finishes, final, interior metal structures	2-620		
Finishes, removal of	2-592		
Finishes, special	2-623		
Fuselage sealing	2-554		
Hardware	2-566		
Hardware, rivets	2-567		
Heat-resistant steel, surface treatment of	2-615		
Heavily-stressed areas, repair near adjacent structure		2-7	
Heavily-stressed areas, skin repair across stiffener		2-7	
Heavily-stressed areas, isolated damage, repair of		2-7	

Table 2-14. Repair Procedures and General Information Reference — Continued

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Hi-lok bolts, substitution for	2-570		2-21
Hinge repairs	2-657	2-131	2-25
Honeycomb repairs, sandwich, classification of damage	2-632		
Huck bolts, substitution for	2-570		2-21
Jo bolts, substitution for	2-571		2-22
Magnesium alloys, surface treatment of	2-612		
Metal structures, interior, final finish	2-620		
Markings, internal, cabin window emergency		2-129	
Markings, internal, cable cutter		2-129	
Markings, internal, cockpit and cabin, looking down		2-129	
Markings, internal, door opening instructions		2-129	
Markings, internal, emergency exit		2-129	
Markings, internal, emergency handle		2-129	
Markings, internal, fuel warning light		2-129	
Markings, internal, fuel valve warning light		2-129	
Markings, interior, hoist control		2-129	
Markings, internal, legend markings		2-129	
Markings, internal, left side		2-129	
Markings, internal, notes		2-129	
Markings, internal, ramp extension		2-129	
Markings, internal, right side		2-129	
Markings, internal, SAS drain wl 22, bl 5.5		2-129	
Markings, internal, sequence valve		2-129	
Markings, internal, sta 95, aft side		2-129	
Markings, internal, sta 116, wl 12, looking inbd		2-129	
Markings, internal, sta 120, looking outbd		2-129	
Markings, internal, sta 120 to 160, looking up		2-129	
Markings, internal, sta 160, aft side, looking fwd		2-129	
Markings, internal, sta 320 to 340, looking up		2-129	
Markings, internal, sta 242 and sta 364		2-129	
Markings, internal, sta 440 to 482, looking up		2-129	
Markings, internal, sta 482, looking aft		2-129	
Markings, internal, sta 482 to 510		2-129	
Markings, internal, sta 502.4, looking fwd		2-129	
Markings, internal, sta 534 and aft, looking up		2-129	
Markings, internal, sta 534, looking fwd		2-129	
Markings, internal, sta 534 to 594, looking up		2-129	
Markings, internal, sta 555, looking fwd		2-129	
Markings, internal, sta 575, looking fwd		2-129	
Markings, internal, sta 594, looking aft		2-129	
Markings, internal, wl 34.5, bl 12, looking aft		2-129	
Markings, internal, wl 34.5, aircraft cl		2-129	
Material, trade name reference			2-15
Metal parts, surface treatment, (except organic finishing)	2-610		
Nickel, surface treatment of	2-614		
Non-skid paint, application of	2-627		
Nut, washers, and cotter pins	2-576		
Oilcan inspection and repair	2-635		
Organic finishing, nonmetallic parts	2-622		
Organic finishing, metal parts	2-617		
Palmer 611 compound, application of	2-591		
Polycarbonate (thermoplastic) parts, repair ir	2-629		
Repairs, typical	2-653		
Rivet selection, aluminum alloy parts		2-127	
Rivet selection, corrosion-resistant steel parts		2-127	
Rivet selection, magnesium alloy parts		2-127	
Rivet spacing, aluminum-alloy parts		2-127	
Rivet spacing, corrosion-resistant steel parts		2-127	
Rivet spacing, magnesium alloy parts		2-127	
Rivets, AN, substitution for			2-20
Seal, rubber, repair	2-656	2-130	
Sealants, acceptable, properties & working criteria			2-19
Sealing, fillets and seams		2-126	

Table 2-14. Repair Procedures and General Information Reference — Continued

NOMENCLATURE	PARA NO.	FIG. NO.	TABLE NO.
Sealants, mixed, storage	2-558		
Sealants, two-part, mixing	2-559		
Sealing, gaps ang joggles		2-126	
Sealing, aft pylon and ramp		2-125	
Sealing, floor panels		2-125	
Sealing, forward pylon		2-125	
Sealing, fuselage, cabin-antennae lights and bottom panel		2-125	
Sealing, fuselage, heater inlet		2-125	
Sealing, fuselage, nose section		2-125	
Sealing, fuselage, pod		2-125	
Sealing, fuselage, wheels, antennae		2-125	
Sealing legend		2-125	
Skin and web repairs	2-646	2-7	
Skin repair, coin patch	2-647		
Similar metal contact, treatment, nonfaying surfaces	2-618		
Storage, sealing compound	2-558		
Surface preparation, sealing	2-556		
Surface treatment, aluminum alloys	2-611		
Surface treatment, brass, bronze, and nickel	2-614		
Surface treatment, carbon steel and low alloy steel	2-613		
Surface treatment, heat-resistant steels	2-615		
Surface treatment, magnesium alloys	2-612		
Surface treatment, titanium alloys	2-616		
Thermoplastic, (polycarbonate) parts, repair of	2-629		
Titanium, surface treatment	2-216		
Tubing, aluminum, repair	2-655	2-18	
Temporary patch, skin	2-651		
V-bolts, substitution for			2-22
Velcro tape, application of	2-588		
Walkways	2-626		
Washers	2-576		
Web, backing plate repair	2-649	2-7	
Web damage, repair	2-646	2-7	

Table 2-15. Trade Name Reference

TRADE NAME	TYPE OF MATERIAL
Cellophane	Cellulose Film
Conolite	Polyester Resins and Laminates
Cymel	Melamine Molding
Dacron	Polyester Fiber
Dylene	Polystyrene
Estane	Urethane Elastomer
Kralastic	Acrylonitrile-Butadiene Styrene (A-B-S) Sheet
Lucite	Acrylic Sheet
Lusterlite	Pearlescent Acrylic Sheet
Marbond	Styrene
Mylar	Polyester Film
Nylasint	Sintered Nylon
Orlon	Acrylic Fiber
Plexiglas	Acrylic Sheet
Seilon S-3	A-B-S Polymer Blend
Silastic	Silicone Rubber
Teflon	Fluorocarbon
Videne	Polyester Film
Zytel	Nylon Resin

2-541. Application of Adhesive, System No. 2.

WARNING

The adhesives under this system are toxic and flammable. Work in well-ventilated areas away from flame.

a. (Refer to table 2-18 for the list of acceptable adhesives.) Clean faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly stir adhesive in its own container using a spatula.

NOTE

The adhesive has a tendency to settle. It must be stirred occasionally during use.

c. If adhesive is being applied by spraying, thin it with naphtha (C217).

d. Apply a uniform coat of adhesive to both faying surfaces.

e. Allow adhesive to dry until it is tacky and does not transfer when touched lightly with the knuckle.

Table 2-16. Adhesive System Selection

	Acrylics	Cellulosic	Cork	Fabrics	Felt	Glass, Ceramics	Leather	Melamine	Metals: Aluminum and Steel	Metals: Brass and Copper	Nylon	Paper, Cardboard	Phenolics	Polycarbonate	Polyesters and Epoxy Laminates	Polystyrene A-B-S	Polyurethane Foam	Polyvinylchloride--Flexible	Polyvinylchloride--Rigid	Rubber: Buna-N	Rubber: Butyl	Rubber: Fluorosilicone	Rubber: Neoprene	Rubber: Polyurethane	Rubber: Silicone	Rubber: Viton	Teflon	Wood
Acrylics	13																											
Cellulosic	2	1																										
Cork	2	1	1,2,5																									
Fabrics	2	1	1,2,5	1,2,5																								
Felt	2	1	1,5	1,5	1																							
Glass, Ceramics	2	1	1,2,5	1,2,5	1,5	1,5,4																						
Leather	2	1	1,2,5	1,2,5	1,5	1,2,5	1,2																					
Melamine	2	1	1,5,9	1,5	1,5	5,9	1,5,9	5,4																				
Metals: Aluminum and Steel	2,5	1	1,5,9	1,5	1,5	1,5,9	1,2,5	1,5,9	1,5,9																			
Metals: Brass and Copper	2	1	1	1,2	1	1,2	1,2	1,2	1,2	1																		
Nylon	2	1,2	1	1,2,5	1,5	1,5,9	1,2,5	1,5	1,5	1	5																	
Paper, Cardboard	2	1,2	1,2	1,2	1	1,2	1,2	1,2	1,2	1,2	1,2	1,2																
Phenolics	2	1	1,2,5	1,5	1,5	1,5,9	1,5	1,5	1,5	1,2	1,5	1,2	1,5,4															
Polycarbonate	2							3	3	3			3	3														
Polyesters and Epoxy Laminates	2	1	1,5	1,5	1,5	1,5	1,5	5,10	1,5	1	1,5	1,2,5	5	3	5,9,12													
Polystyrene A-B-S	2	1	1,5	1,5	1,5	1,2,5	1,2,5	1,2,5	1,2,5	1,2	1,2,5	2	1,2,5		1,2,5	1,5												
Polyurethane Foam	2	1,2	1,2	1,2	1	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2		1,2	1,2	1,2											
Polyvinylchloride--Flexible	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										
Polyvinylchloride--Rigid		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
Rubber: Buna-N	2	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1			1								
Rubber: Butyl	11	1	1	1	1	1	1	1	1	1	1	1	1		1	1					1							
Rubber: Fluorosilicone								6	6	6			6		6							6						
Rubber: Neoprene	11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1		1					
Rubber: Polyurethane								3	3	3			3	3	3			3	3				3	3				
Rubber: Silicone	8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8		7,8	7,8	7								7,8			
Rubber: Viton								4	4	4			4		4											4		
Teflon	2	1	1,5	1,2,5	1	1,5,9	1,2	1,5,9	1,5,9	1	5		1,5,9		5,9	1,5	1,2	1	1	1	1		1		7,8		1,5,9	
Wood	2	1	1,2,5	1,2,5	1,5	1,5	1,2,5	1,2,5	1,5,9	1,5,9	1,5	1,2	5,9		5	1,5	1,2	1,5	1,5	1	1		1		7,8		5	5

Table 2-17. Adhesive System Criteria

ADHESIVE SYSTEM NO	NO. OF COMPONENTS	PHYSICAL PROPERTIES	POT LIFE AT 21.1°C (70°F)	FLASH POINT	SHELF LIFE	STORAGE TEMPERATURE
1	1	A tough, flexible contact adhesive with good peel strength. Good resistance to fuel, oil, and water	N/A	30°F (-1°C)	9 months	Below 80°F (27°C)
2	1	A flexible water resistant contact cement. Poor resistance to fuel and oil	N/A	54°F (12°C)	9 months	40° to 80°F (4° to 27°C)
3	2	Cures to a tough flexible rubber; resistant to oil	40 to 60 minutes	—	12 months	40° to 80°F (4° to 27°C)
4	2	Cures to a tough flexible rubber; resistant to fuel and oil	24 hours	50°F (10°C) for primer	12 months for adhesive 90 days for primer	Below 80°F (27°C)
5	4	A rigid epoxy adhesive, high in tensile and shear strength. Resistant to fuel and oil; fair resistance to water	2 hours	Part AB: 395°F (202°C) Part CD: 468°F (242°C)	2 years	Below 80°F (27°C)
6	1	Cures to a flexible rubber; resistant to fuel and oil	30 minutes	50°F (10°C) for primer	8 months for adhesive 12 months for primer	Below 70°F (21°C)
7	2	A water resistant contact adhesive. Cures to a resilent film with very low bond strength. Poor resistance to fuel and oil	2 to 4 hours	60° to 90°F (16° to 32°C) for primer	6 months for adhesive and catalyst 12 months	Below 75°F (24°C)
8	1	Cures to a rubbery solid. Excellent peel strength and good insulating properties. Resistant to water and ozone. Poor resistance to oil and no resistance to fuel	5 to 10	50°F (10°C) for primer	8 months for adhesive 12 months for primer	Below 80°F (27°C)
9	2	A rigid adhesive high in tensile and shear strength, but low in peel strength. Good resistance to fuel and oil but poor resistance to water and salt spray	1 hour	150°F (66°C)	2 years	Below 80°F (27°C)
10	2	A tough flexible adhesive, resistant to water, fuel and oil. Poor resistance to salt spray	30 minutes	150°F (66°C)	6 months	Below 80°F (27°C)

Table 2-17. Adhesive System Criteria — Continued

ADHESIVE SYSTEM NO.	NO. OF COMPONENTS	PHYSICAL PROPERTIES	POT LIFE AT 21.1°C (70°F)	FLASH POINT	SHELF LIFE	STORAGE TEMPERATURE
11 SEE NOTE	2	Cures to a tough, flexible rubber with good peel strength. Resistant to fuel, water, and salt spray	½ hr for B-½ 1 hr for B-1 2 hr for B-2 4 hr for B-4 8 hr for B-8	80°F (27°C)	6 months	40° to 80°F (4° to 27°C)
12	2	A rigid adhesive high in shear and tensile strength	20 to 30 minutes	395°F (202°C)	2 years	Below 80°F (27°C)
13	3	A rigid adhesive which will not craze acrylics	10 minutes	—	1 year	Below 75°F (24°C)

NOTE

The acceptable adhesives under this system are available in a choice of pot lives. For example, B-½ indicates a pot life of 30 minutes, B-1 a pot life of 1 hour, etc. The letters and numbers "B-½", "B-1", etc. will be found as part of the manufacturer's designation for these adhesives in table 1-5.

NOTE

When bonding a large area, let adhesive dry until it is not tacky. Then, reactivate it by wiping one of the surfaces with cheesecloth (C95) damp with naphtha (C217).

f. Press or roll parts together, applying sufficient pressure to ensure solid contact and removal of all entrapped air.

NOTE

The assembled parts may be handled immediately.

2-542. Application of Adhesive, System No. 3.

WARNING

The adhesives under this system are toxic. Work only in well-ventilated areas.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces using naphtha (C217). (Refer to para 2-538.)

b. Stir individual components in their own container then blend them as follows:

(1) If adhesive (C50) is being used, blend 100 parts, by weight, of part A with 34 parts, by weight, of part B.

(2) Of adhesive (C51) is being used, blend 100 parts, by weight, of part A with 40 parts, by weight, of part B.

NOTE

The pot life is 40 minutes for adhesive (C50) and 45 minutes for adhesive (C51).

c. Apply a coat of primer J (C263) to all surfaces except brass or neoprene. Use primer H (C262) for brass or neoprene surfaces. Let primer dry for 30 to 40 minutes.

NOTE

Primer is not required on polycarbonate plastic surfaces.

d. Apply the adhesive to both faying surfaces, using a brush or spatula.

e. Join coated surfaces and apply light pressure.

f. Let adhesive (C50) cure for 3 days at 70°F (21°C). Adhesive (C51) cures in 2 days at same temperature.

NOTE

Both adhesives cure in 3 hours at 150°F (66°C).

2-543. Application of Adhesive, System No. 4.

WARNING

The adhesives under this system are toxic and flammable. Work only in well-ventilated areas away from flame.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean all faying surfaces with methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Brush one uniform coat of primer (C264) on all faying surfaces, except rubber surfaces. Let primer dry for 30 to 60 minutes.

c. Thoroughly blend 20 parts, by weight, of the adhesive base with 1 part, by weight, or accelerator.

NOTE

The pot life of blended adhesive is 24 hours.

d. Bond rubber to surfaces other than rubber, as follows:

(1) Brush one uniform coat of blended adhesive, on rubber surface. Let it dry for 30 to 60 minutes.

Table 2-18. Acceptable Adhesives

ADHESIVE SYSTEM NO.	ITEM NO.	MANUFACTURER'S DESIGNATION	APPLICATION AND CURE PARA NO.
1	C90	Pro-Seal 590M	2-540
	C88	M6249	
2	C86	EC-1128	2-541
	C49	Tereco No. 68	
3	C50	Uralane 5716, Parts A and B	2-542
	C262	Primer H	
	C263	Primer J	
	C51	Uralane 8089, Parts A and B	
	C262	Primer H	
	C263	Primer J	
4	C46	PR1710	2-543
	C264	PR1711 Primer	
5	C22	Component A: Epon 828 Component B: Epon 812 Component C: Versamid 115 Component D: Versamid 125	2-544
	C32	Component A: EC-2216 Part A Component B: EC-2216 Part B	
	C23	Component AB: Hysol 4405 Component CD: Hysol 3538	
	C25	Component AB: Sa Co 2862 (Component 1) Component CD: Sa Co 28621 (Component 2)	
	C28	Component AB: 522 Component CD: 542	
	C26	Component AB: XS-1173625A Component CD: XS-1173625B	
	C27	Component AB: 183-C-417 Component CD: 183-C-418	
	C24	Component AB: J1170-1 ComponentCD: E-18-1	
6	C48	Q-2-0046	2-545
	C265	RTV-1200 Primer	
7	C42	A-4000 Silicone Adhesive	2-546
	C42	A-4000 Catalyst	
	C257	A-4014 Primer	
8	C53	92-018	2-547
	C265	RTV-1200 Primer	
9	C40	Epon 901	2-548 and 2-549
	C80	B-1 Catalyst (Option 1)	
	C81	B-3 Catalyst (Option 2)	
	C30	190-H-1 Resin 191-C-21 Catalyst (Option 1)	
	C29	190-H-1 Resin 190-B-10 Catalyst (Option 2)	
10	C45	Pro-Seal 501	2-550
11	C31	EC-1239	2-551
	C44	Pro-Seal 719	
	C47	PR9021	
12	C39	Epon 828	2-552
	C129	Curing Agent DTA	
13	C89	PS-18 Cement	2-553
	C83	PS-18 Catalyst	
	C268	PS-18 Promoter	

NOTE

For best results the adhesive should be 0.002- to 0.003-inch thick.

(2) Brush one coat of adhesive on primed surface, other than rubber. Let adhesive dry until tacky.

(3)Join coated surfaces with sufficient pressure to ensure solid contact.

(4) Let adhesive cure under pressure for 16 hours at 70°F (21.1°C) before handling.

NOTE

Complete cure is achieved after 7 days at 70°F (21.1°C), or in 16 hours at 70°F (21.1°C), followed by 1 hour at 200°F (93°C).

e. Bond rubber to rubber as follows:

(1) Brush one uniform coat of the blended adhesive, on both faying surfaces. Let it dry for 30 to 60 minutes.

(2) Brush a second coat on one of the surfaces. Let it dry until tacky.

(3) Join coated surfaces with sufficient pressure to ensure solid contact.

(4) Let adhesive cure under pressure for 16 hours at 70°F (21.1°C) before handling.

NOTE

Complete cure is achieved after 7 days at 70°F (21.1°C), or in 16 hours at 70°F (21.1°C), followed by 1 hour at 200°F (93°C).

2-544. Application of Adhesive, System No. 5.

WARNING

The adhesives under this system are toxic and may irritate skin. Work only in well-ventilated areas. Avoid bodily contact with the adhesives.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces, using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. If adhesive (C32) is used, blend 100 parts, by weight, of part B with 140 parts, by weight, of part A.

c. If adhesive (C25) is used, thoroughly blend equal parts of components A and B to form component AB. Thoroughly blend equal parts of components C and D to form component CD. Thoroughly blend equal parts of the combined components AB and CD.

d. If adhesives (C23, 24, 25, 26, 27, or 28) are used, thoroughly blend equal parts of components AB and CD.

e. Apply a thin uniform coat of blended adhesive to faying surfaces.

f. Assemble parts and apply sufficient pressure to ensure solid contact.

g. Remove excess adhesive, using methyl-ethyl-ketone.

h. Allow adhesive to cure in accordance with one of the following cure cycles:

(1) 30 to 60 minutes 200°F (93°C).

(2) 2 hours at 170°F (77°C).

(3) 8 hours at 120°F (49°C).

(4) 11 hours at 104°F (40°C).

(5) 24 hours at 70°F (21°C).

2-545. Application of Adhesive, System No. 6.

WARNING

The adhesives under this system are toxic and flammable. Work only in well-ventilated areas away from flame.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Brush two coats of primer (C265) on all surfaces, other than rubber. Allow 45 minutes drying time after each coat.

c. Brush a uniform coat of adhesive (C48) on both faying surfaces, and immediately join coated surfaces.

NOTE

Exposure to air for more than a few minutes will cause adhesive surface to dry, resulting in a poor bond.

d. Apply sufficient pressure to ensure solid contact but not enough to cause excessive adhesive squeezeout.

NOTE

A bond line thickness of 0.015 inch will give best results.

e. Let adhesive cure for a minimum of 24 hours at 70° to 80°F (21.1° to 26.7°C).

NOTE

Complete bond strength is achieved after approximately 3 days.

2-546. Application of Adhesive, System No. 7.

WARNING

These adhesives are toxic and flammable. All procedures should be performed in a well-ventilated area and away from open flame. Hydrogen is generated by catalyzed adhesive during cure. Therefore, all containers of material should be vented to avoid pressure buildup.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean all faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Brush or spray a thin coat of primer (C257) on all bonding surfaces, except silicone rubber.

c. Let primer dry for 30 minutes.

d. Prepare required amount of adhesive (C42) by adding 16 drops of catalyst (C42) to ½ ounce of adhesive. Stir adhesive constantly while adding catalyst.

NOTE

The pot life of catalyzed adhesive is 2 to 4 hours.

e. Brush a uniform coat of catalyzed adhesive on all faying surfaces. Let adhesive air dry approximately 30 minutes or until tacky.

f. To ensure solid contact and removal of entrapped air, join faying surfaces with moderate pressure.

g. Remove pressure and cure adhesive bond for 24 hours at 70°F (21°C). Maximum bond strength is achieved in 4 to 7 days.

2-547. Application of Adhesive, System No. 8.

WARNING

The adhesives under this system are toxic and flammable. Work only in well-ventilated areas away from flame.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean all faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Brush or spray a liberal coat of primer (C265) on all bonding surfaces except silicone rubber.

c. Let primer dry for at least 30 minutes.

d. Apply a uniform layer of adhesive to both surfaces; immediately join surfaces.

e. Apply enough pressure to ensure solid contact but not enough to cause excessive squeezeout.

NOTE

A bond line thickness of at least 0.015 inch will give best results.

f. Let adhesive cure under contact pressure for 24 hours at 60° to 70°F (21° to 27°C). Maximum strength is achieved after approximately 3 days.

2-548. Application of Adhesive, System No. 9 (Option 1).

WARNING

The Adhesives under this system can irritate skin. Avoid bodily contact with the adhesives.

NOTE

Existing stocks of the replaced adhesives designated as Epon VI and Epon VIII (C37, C38) may be used until depleted.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly blend 100 parts, by weight, of base with 16.5 parts, by weight, of catalyst.

c. Apply a thin coat of adhesive to both faying surfaces, using a spatula.

d. Join parts, applying enough pressure to ensure solid contact.

NOTE

A continuous bead of adhesive squeezeout indicates solid contact.

e. Remove excess adhesive using methyl-ethyl-ketone (C216).

f. Let adhesive cure for 12 hours at 70°F (21°C), for 2 hours at 125°F (52°C), or 1 hour at 200°F (93°C).

2-549. Application of Adhesive, System No. 9 (Option 2).

WARNING

The adhesives under this system can irritate skin. Avoid bodily contact with the adhesives.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly blend 100 parts, by weight, of base with 10.9 parts, by weight, of catalyst.

NOTE

Thorough blending is extremely important. A 50-gram batch of adhesive will usually require at least 6 minutes of constant, vigorous stirring.

c. Apply a thin coat of blended adhesive to both faying surfaces.

d. Join parts, applying sufficient pressure to ensure solid contact.

NOTE

A continuous bead of adhesive squeezeout indicates solid contact.

e. Remove excess adhesive using methyl-ethyl-ketone (C216).

f. Cure adhesive for 30 minutes at 240°F (116°C). Then cure for 1½ hours at 350°F (177°C).

2-550. Application of Adhesive, System No. 10.

WARNING

The adhesives under this system are toxic. Work only in well-ventilated areas.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean all faying surfaces using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly mix each component in its own container.

c. Thoroughly blend 30 parts, by weight, of accelerator with 100 parts, by weight, of base.

d. Apply a uniform coat of blended adhesive to both faying surfaces.

e. Join parts, applying sufficient pressure to ensure solid contact.

f. Remove adhesive squeezeout using methyl-ethyl-ketone (C216).

g. Let the adhesive cure for 12 hours at 70°F (21°C). Full cure is attained after 48 hours.

2-551. Application of Adhesive, System No. 11.

WARNING

The adhesives under this system are toxic and flammable. Work only in well-ventilated areas away from flame.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean all faying surfaces, using methyl-ethyl-ketone (C216). Refer to para 2-538.

b. Thoroughly blend base with activator in accordance with instructions on container.

c. Apply a thin uniform coat of adhesive to both faying surfaces.

d. Assemble parts immediately, apply sufficient pressure to ensure solid contact.

e. Let adhesive cure at 70°F (21°C) for one of the following periods of time, depending upon class of adhesive used:

(1) Class B-½ — 16 hours
(2) Class B-1 — 36 hours
(3) Class B-2 — 48 hours
(4) Class B-4 — 60 hours

NOTE

The above cure times are for handling only. Full cure is not achieved for 7 days or more.

2-552. *Application of Adhesive, System No. 12.*

WARNING

The adhesives under this system are toxic. Work only in well-ventilated areas.

a. (Refer to table 2-18 for list of acceptable adhesives.) Clean faying surfaces using naphtha (C218). Refer to para 2-538. Roughen area slightly with abrasive paper (C3 or C4).

b. Place 9 parts, by weight, of curing agent (C129) and 100 parts, by weight, of adhesive (C39) into a clean container and mix thoroughly.

c. Brush one coat of adhesive on each ply of repair part.

d. Assemble plies, while still wet, on a Teflon sheet (C356).

e. Brush final coat of adhesive on assembled plies.

f. Place assembled plies, with Teflon sheet exposed, on area to be repaired.

g. Remove entrapped air by working a roller across the patch.

h. Apply a slight pressure to repaired area with wooden blocks and C-clamps.

i. Let repaired area cure 4 hours at 70°F (21°C) or use heat lamps and cure area at 150° to 170°F (66° to 77°C) for 1 hour. Remove blocks, clamps, and Teflon sheet.

2-553. *Application of Adhesive, System No. 13.*

WARNING

The adhesives under this system are toxic and can irritate the skin. Work only in well-ventilated areas and avoid bodily contact with adhesives.

a. (Refer to table 2-18 for list of acceptable adhesives.) Roughen faying surfaces to be bonded, using abrasive paper (C3 or C4).

b. Clean faying surfaces using aliphatic naphtha (C217). Refer to para 2-538.

c. Let area dry thoroughly prior to applying cement.

d. Apply masking tape (C337) to adjacent areas.

e. Place 4 fluid ounces of cement resin (C92) into a clean earthenware container.

f. Add one capsule (2.4 grams) of catalyst (C83) to cement resin and stir resin until capsule is completely dissolved.

NOTE

This mixture can be kept usable for a period not to exceed 24 hours by refrigeration at 40°F (4°C) or lower.

g. Place 5-cubic-centimeters of promoter (C268) into a clean container.

WARNING

A violent reaction will result if the promoter is mixed directly with the catalyst. The cement contains chemicals which may irritate the skin. If contact with skin is made, wash the area immediately with isopropyl alcohol (C54) and flush with soap (C312) and water. Vapors are toxic. Perform all operations in a well-ventilated room.

h. Add promoter to mixture of cement resin and catalyst, and stir ingredients thoroughly.

NOTE

The pot life of adhesive mixture with promoter added is approximately 10 minutes.

i. Brush a thin, uniform coat of cement (C89) on both faying surfaces.

j. Join coated surfaces immediately. Hold them together gently for 15 to 30 seconds before applying pressure.

k. Apply equally distributed pressure with clamps.

l. Scrape excess cement onto masked area.

m. Allow assembly to set for 2 hours.

n. Remove clamps. Allow assembly to cure for 2 hours at a minimum of 70°F (21°C).

o. For final cure, allow assembly to set for 4 hours at 148°F (64°C).

2-554. Fuselage Sealing.

Sealing of the fuselage structure to provide watertightness and flotation capability is accomplished by use of the sealants listed in table 2-19.

2-555. *General.*

All external joints, seams, holes, skin laps, and fasteners shall be sealed as shown in fig. 2-125, using the sealants listed in table 2-19. The general procedures given in para 2-556 thru 2-559 apply to all sealing operations.

2-556. *Surface Preparation.*

All operations, such as fitting, drilling, countersinking, deburring, or other rework should be accomplished prior

Table 2-19. Acceptable Sealants — Properties and Working Criteria

SEALING COMPOUND	WORKING LIFE (HOURS)	CURE TIME (HOURS) (NOTE A.)	USE AND METHOD OF APPLICATION
PR9021A (C305)	1	36	
PR9021A-2 (C305)	2	44	
PROSEAL 719A-2 (C302)	2	44	NOTE 3.
PR9021A-4 (C305)	4	72	
PROSEAL 890B-½ (C301)	0.5	6	
PROSEAL 890B-2 (C301)	2	48	
EC1675B-2 (C300)	2	48	
PROSEAL 890C-24 (C301)	24	168	NOTE 4.
EC1675C-24 (C300)	24	168	
PROSEAL 890C (C301)	48	336	
EC1675C-48 (C300)	48	336	
PROSEAL 890C-80 (C301)	80	504 at 100°F (38°C)	
EC1675C-80 (C300)	80	504 at 100°F (38°C)	
PROSEAL 896 (C303)	2	48	NOTE 5.
PROSEAL 700 (C304)	24	168	NOTE 6.
EC801 (C297)	3	24	NOTE 7.

NOTES

1. Cure temperature is 77°F (25°C) unless otherwise noted
2. Mix sealing compound in accordance with instructions on container
3. Brush applied for fastener sealing
4. Pressure gun or spatula applied for fillets and faying surfaces
5. Pressure gun or spatula applied for hole filling
6. Pressure gun or spatula applied for firewall sealing only
7. Spatula applied for sealing against acids

o sealing, especially on faying surfaces. The cleaned area should be larger than the area to be sealed. Proceed as follows:

a. Clean acrylic plastic surfaces (windshields and panes) with clean, flannel cloths (C108) and cleaner (C103) or cleaning compound (C100). Refer to para 2-608 for information.

b. Clean plastic-impregnated glass cloth parts, using cloths (C104) soaked with acetone (C9). Dry parts with a clean cloth.

c. Clean all metal surfaces to be sealed, with cloths (C104) soaked with solvent (C137).

NOTE

Do not remove aluminized paint from wheel assemblies.

d. Immediately dry area with a cloth (C104) before solvent evaporates.

e. Repeat steps c. and d. until no soil appears on cloths. Three applications of solvent should ensure adequate cleaning.

2-557. Two-Part Sealant Preparation.

a. Weigh out the two components as listed in table 2-19, within 2 percent of actual weight.

b. Mix components thoroughly until a streak-free uniform color is obtained.

NOTE

Avoid whipping action which may entrap air. If mixing machine is used, avoid overheating mixture as this will shorten storage and working life.

2-558. Prepared Sealant Storage.

Mixed sealing compounds which cannot be used within working life specified in table 2-19 may be refrigerated for a maximum of 2 weeks of −40°F (−40°C). Allow sealants removed from refrigeration to reach a minimum temperature of 60°F (16°C) before using. The working life of thawed material is same as freshly mixed sealing compound.

NOTE

Thawing will usually take 20 to 30 minutes. For quicker thawing, place sealant in water at 120°F (49°C) for approximately 10 minutes.

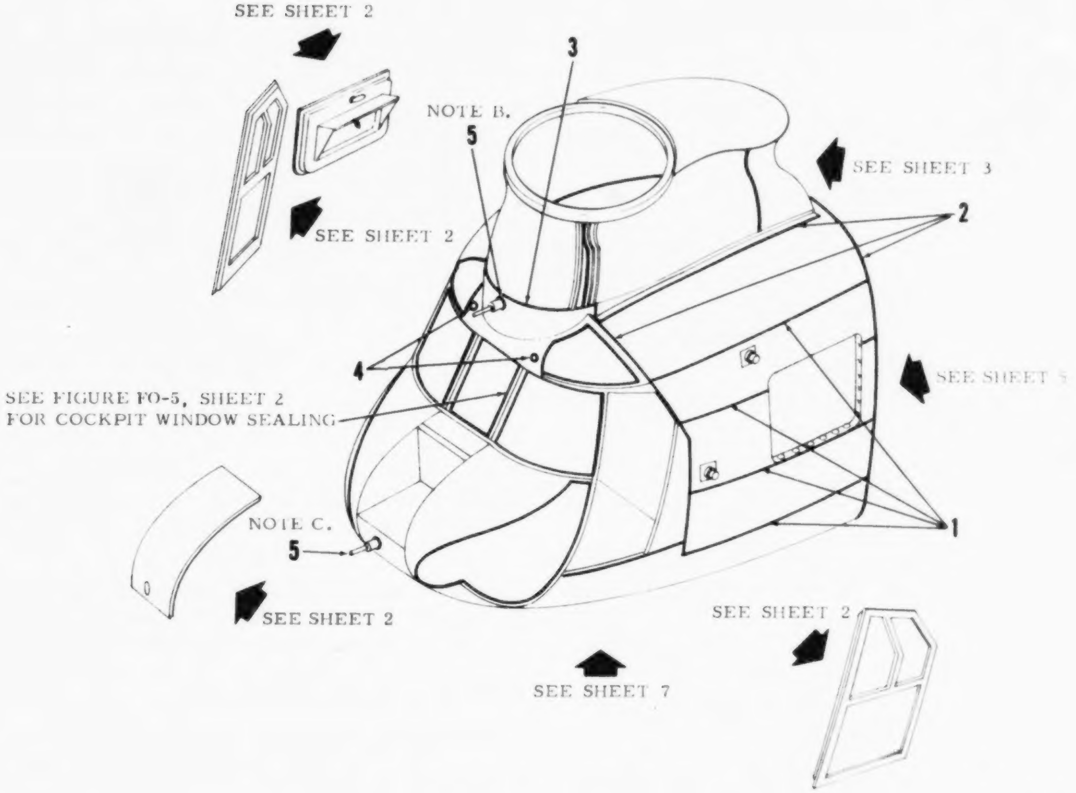
2-559. Application of Sealants.

Table 2-19 lists the applicability of sealing compounds to types of sealing. Subsequent text describes application techniques for types of sealing and rework information for discrepant sealing.

NOTE

All sealing compounds must be applied in time to permit final assembly of faying surface within working life of sealant.

COCKPIT FUSELAGE STRUCTURE SEALING


SEE SHEET 2
3
NOTE B.
5
SEE SHEET 3
2
SEE SHEET 2
4
SEE SHEET 5
SEE FIGURE FO-5, SHEET 2
FOR COCKPIT WINDOW SEALING
NOTE C.
5
1
SEE SHEET 2
SEE SHEET 2
SEE SHEET 7

NOTES

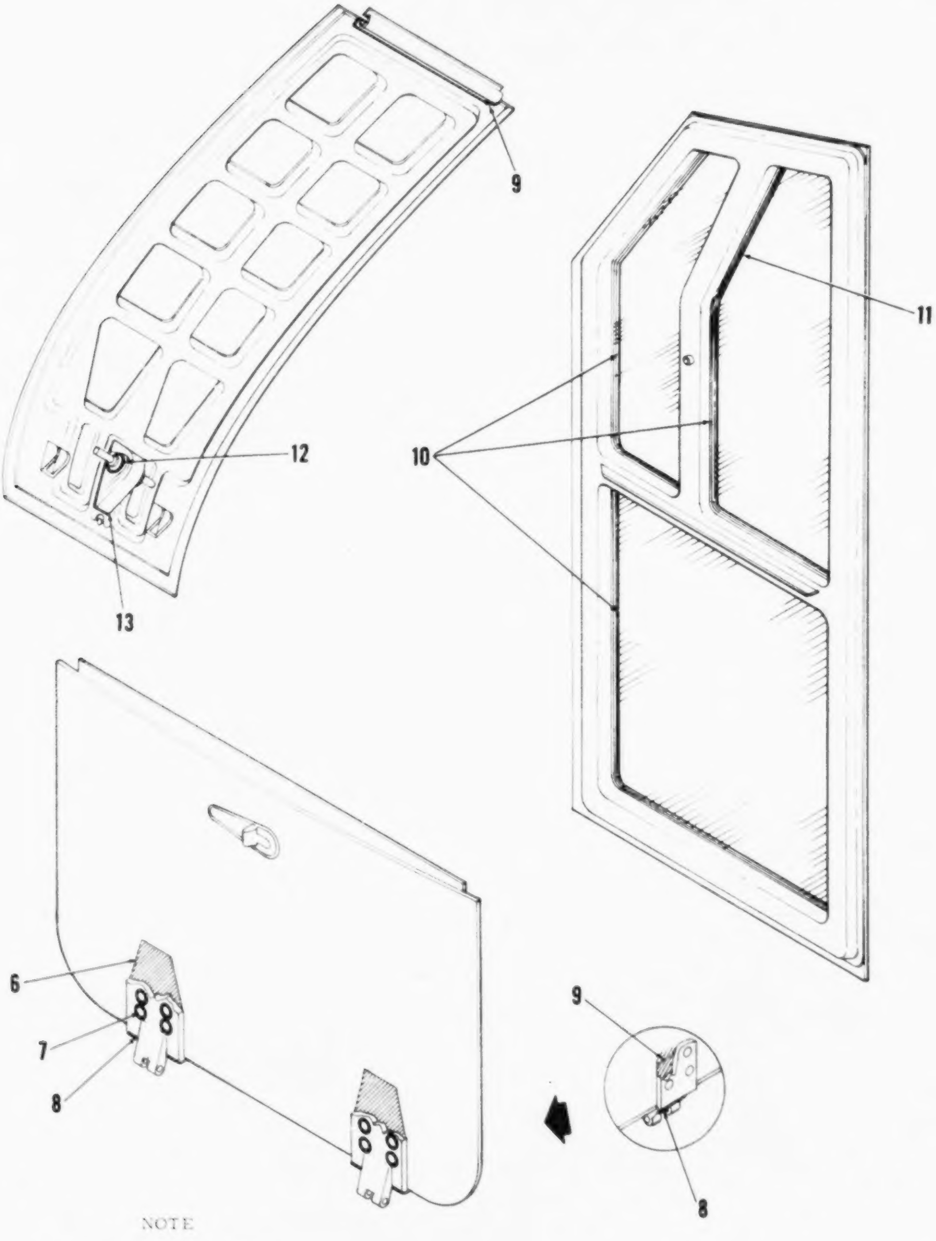
A. INDEX NUMBERS RELATE TO SEALING LEGEND ON SHEET 11
B. USED ON HELICOPTERS 66-19098 THROUGH 68-15857
C. USED ON HELICOPTERS 68-15858 AND SUBQ.

42x37

B114-341-345U

Figure 2-125. Fuselage Sealing (Sheet 1 of 11)

NOSE COMPARTMENT, LOWER CABIN, AND PILOT AND
COPILOT DOOR SEALING



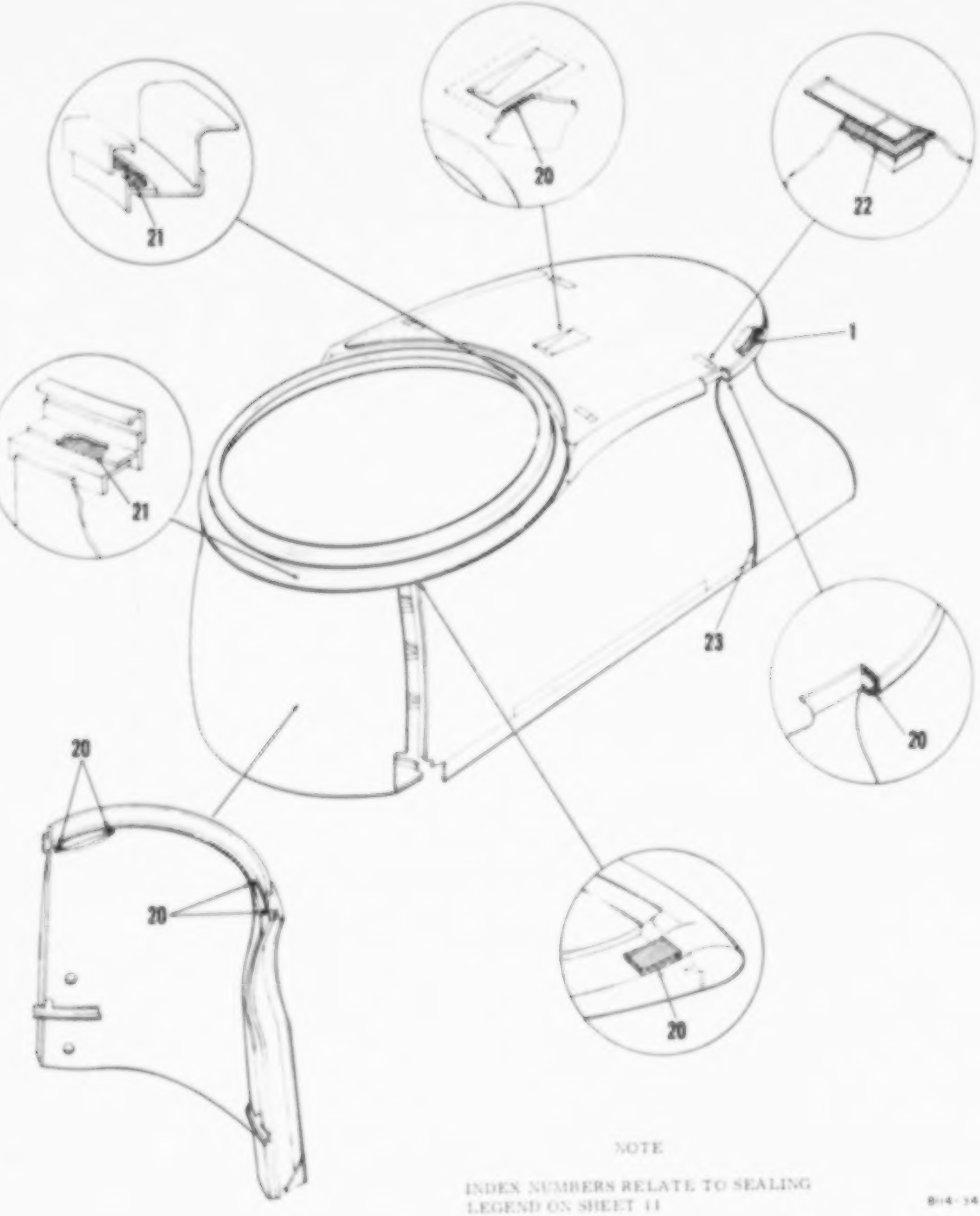
NOTE

INDEX NUMBERS RELATE TO SEALING
LEGEND ON SHEET 11

B14-342-355D

Figure 2-125. Fuselage Sealing (Sheet 2 of 11)

FORWARD PYLON SEALING


21
20
22
1
21
23
20
20
20
20

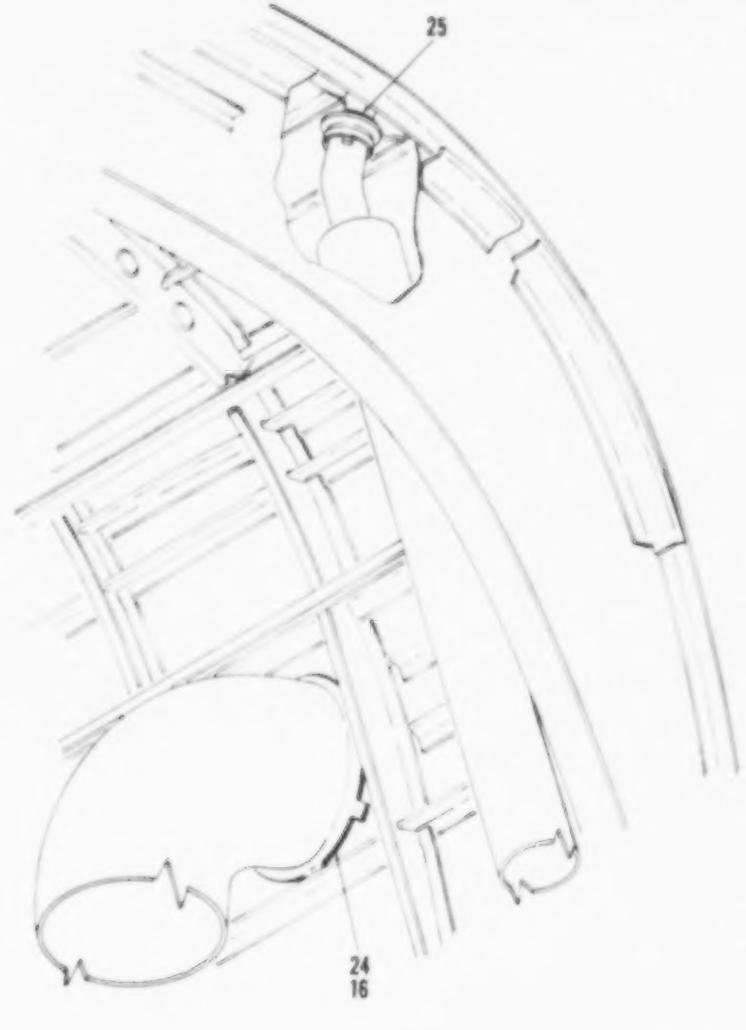
NOTE

INDEX NUMBERS RELATE TO SEALING
LEGEND ON SHEET 11

814-343-355C

Figure 2-125. Fuselage Sealing (Sheet 3 of 11)

HEATER INLET AND EXHAUST SEALING

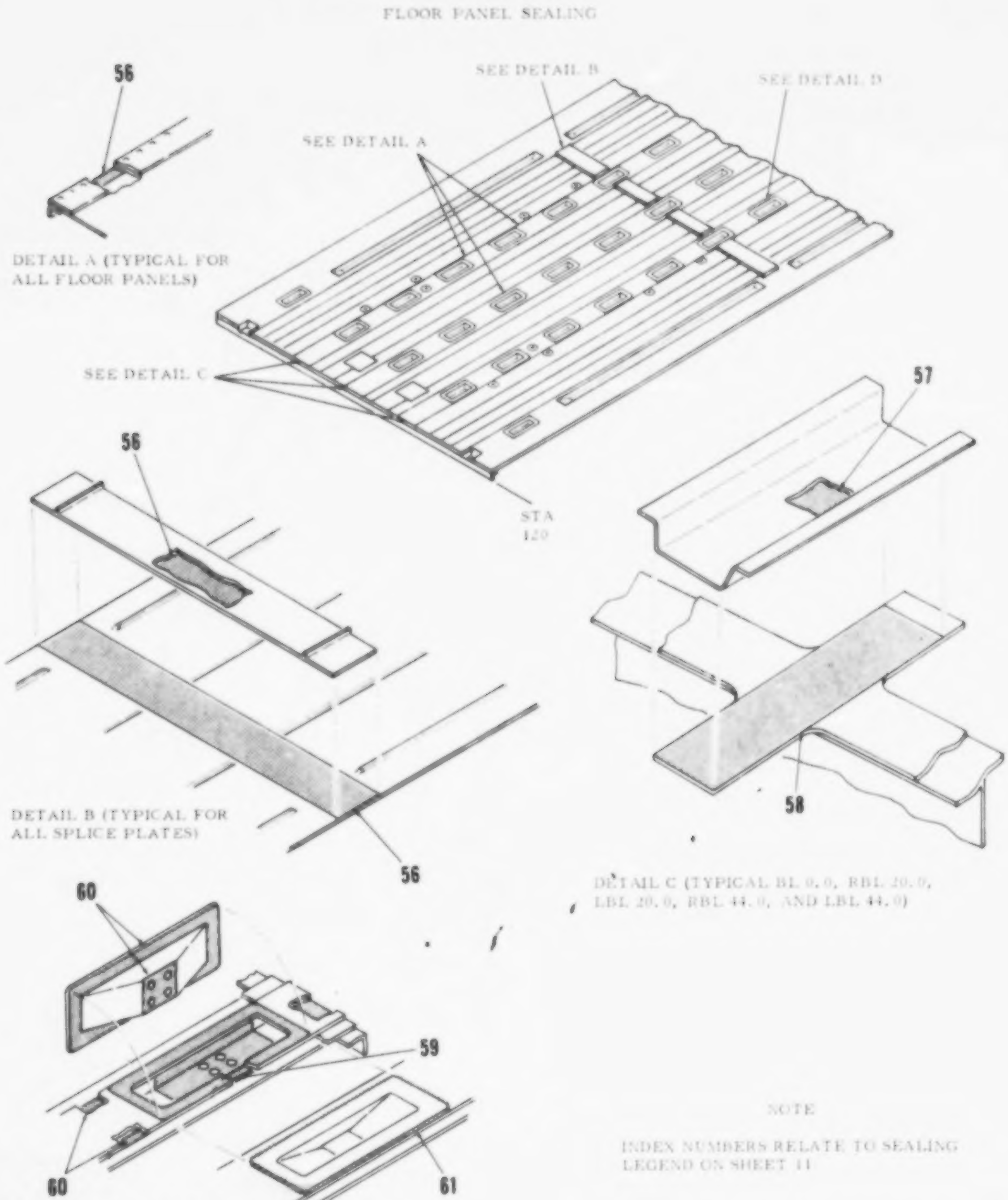


NOTE:

INDEX NUMBERS RELATE TO SEALING
LEGEND ON SHEET 11

B14-344-3550

Figure 2-125. Fuselage Sealing (Sheet 4 of 11)


FLOOR PANEL SEALING
56
SEE DETAIL B
SEE DETAIL D
SEE DETAIL A
DETAIL A (TYPICAL FOR ALL FLOOR PANELS)
SEE DETAIL C
57
56
STA 120
DETAIL B (TYPICAL FOR ALL SPLICE PLATES)
56
58
DETAIL C (TYPICAL BL 0.0, RBL 20.0, LBL 20.0, RBL 44.0, AND LBL 44.0)
60
59
60
61
DETAIL D (TYPICAL FOR ALL RECEPTACLES)

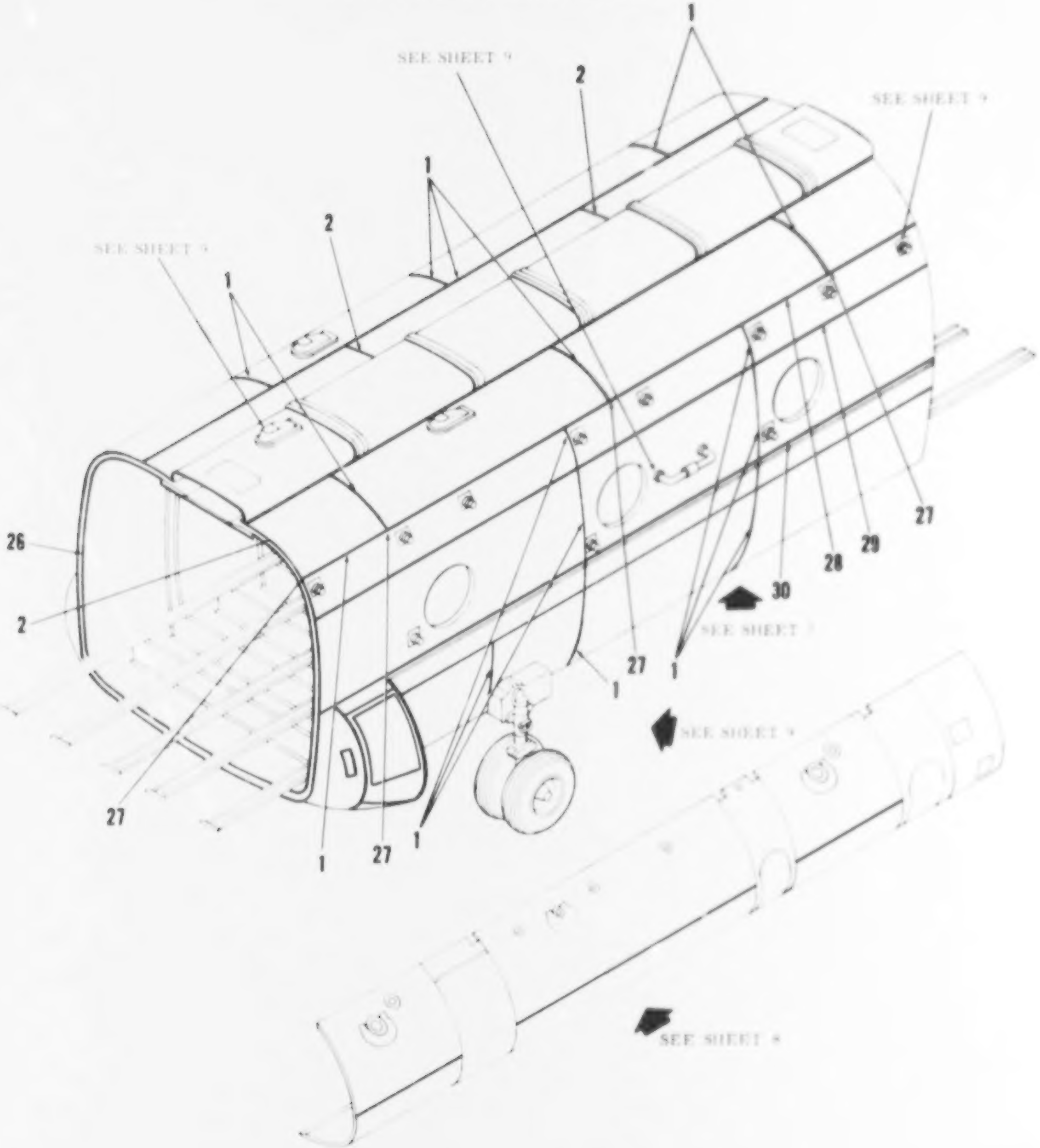
NOTE

INDEX NUMBERS RELATE TO SEALING LEGEND ON SHEET 11

B-4-350-3550

Figure 2-125. Fuselage Sealing (Sheet 5 of 11)

CABIN FUSELAGE STRUCTURE SEALING

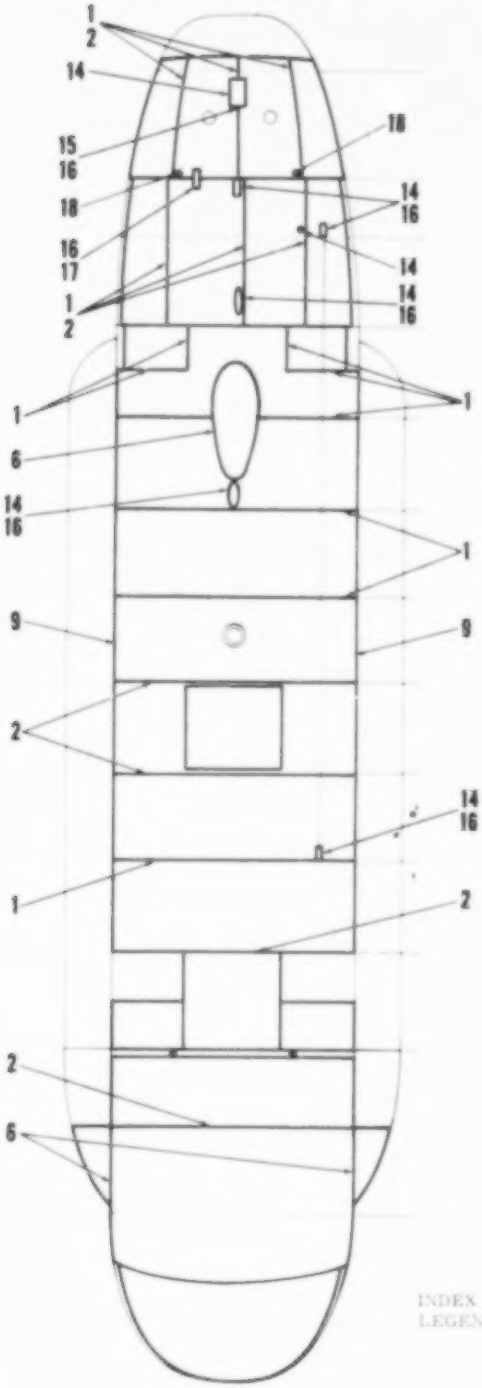

1
SEE SHEET 9
2
SEE SHEET 9
1
2
SEE SHEET 9
1
26
2
27
1
27
1
27
1
27
28
29
27
30
SEE SHEET 7
1
SEE SHEET 9
SEE SHEET 8

NOTE

INDEX NUMBERS RELATE TO SEALING
LEGEND ON SHEET 11

B04 345 3550

Figure 2-125. Fuselage Sealing (Sheet 6 of 11)


ANTENNA, LIGHTS, AND BOTTOM PANEL SEALING

1
2
14
15
16
18
18
14
16
16
17
14
1
2
14
16
1
1
6
14
16
1
9
9
2
14
16
1
2
2
6

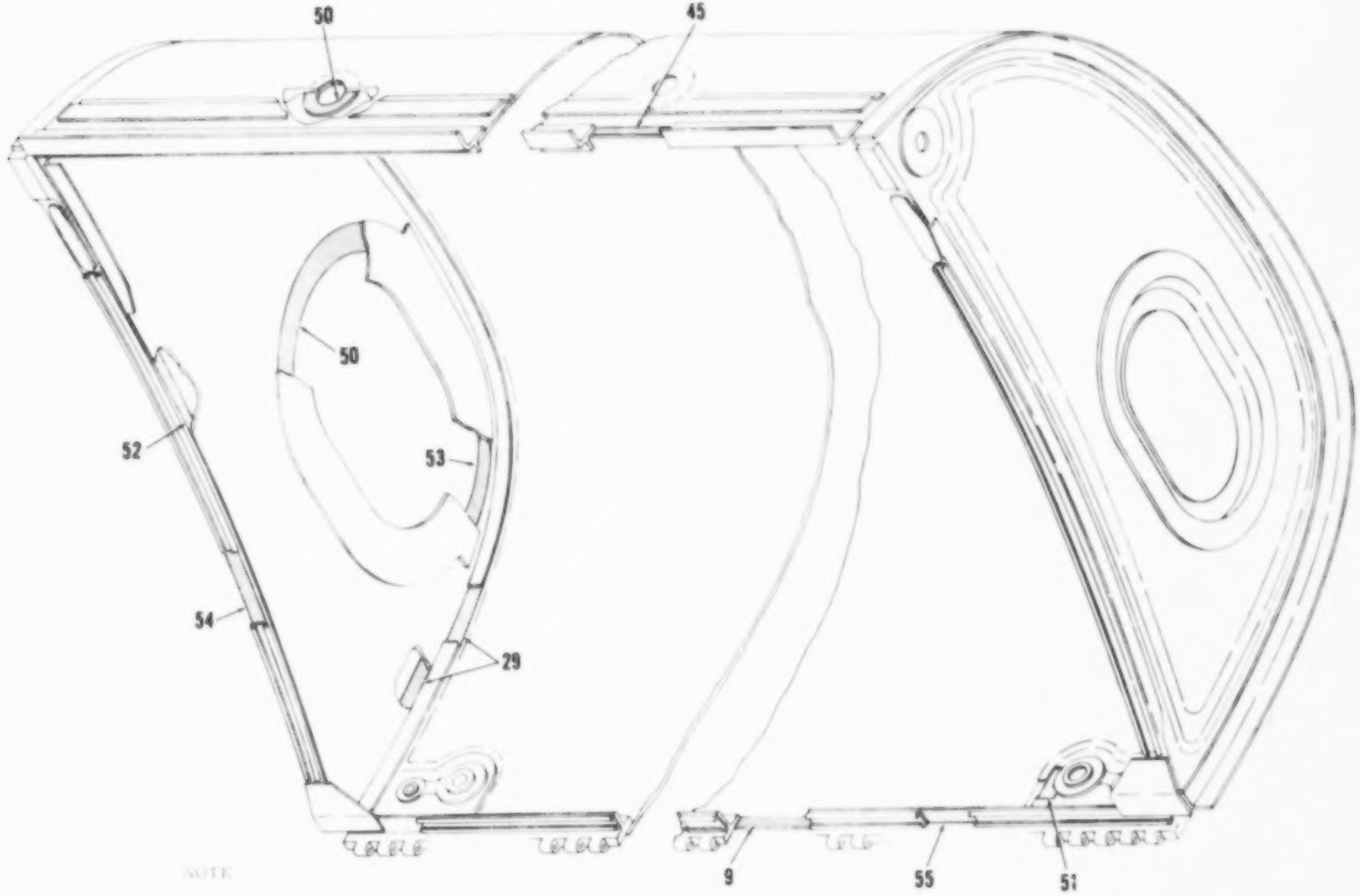
NOTE

INDEX NUMBERS RELATE TO SEALING LEGEND ON SHEET 11

B-4-146-3510

Figure 2-125. Fuselage Sealing (Sheet 7 of 11)

TYPICAL FUEL POD SEALING

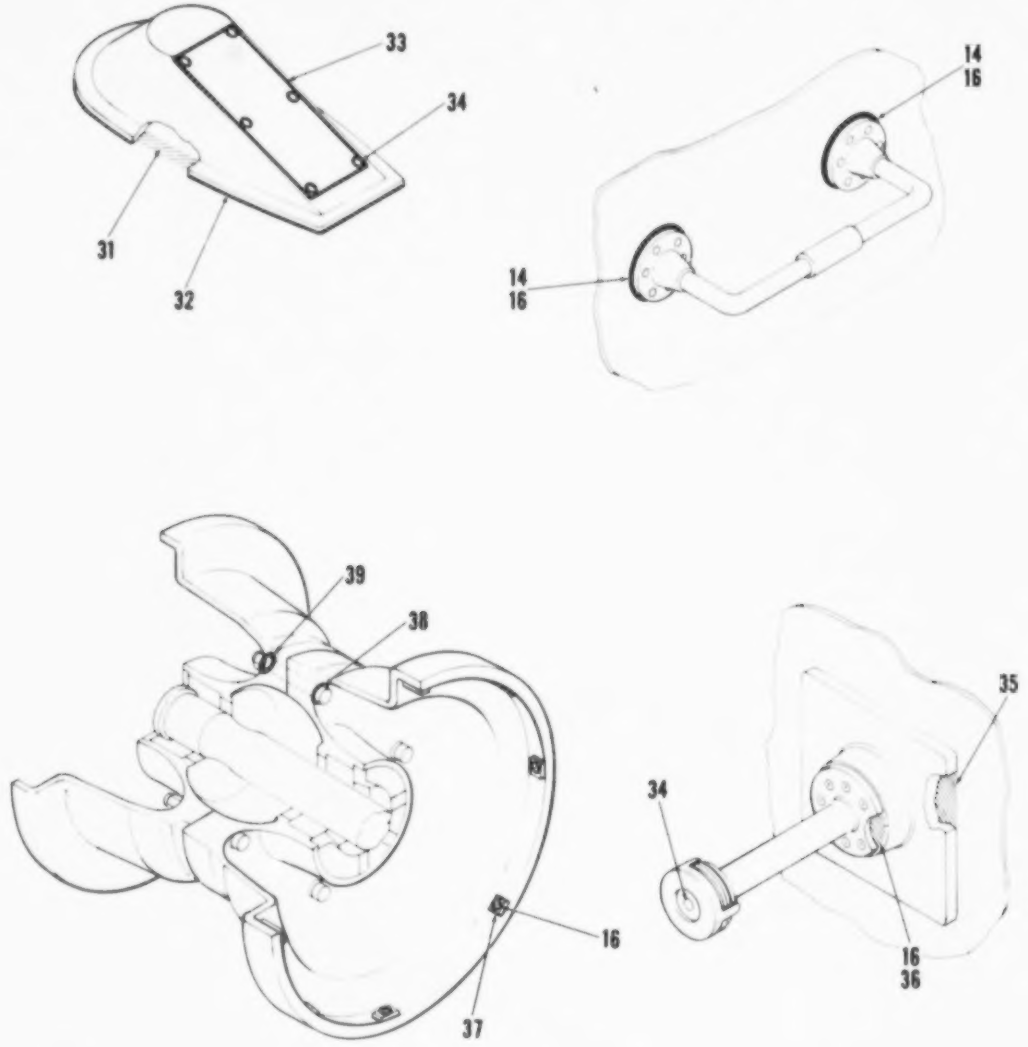

50
45
50
52
53
54
29
9
55
51
B04 347 3550

NOTE

INDEX NUMBERS RELATE TO SEALING LEGEND ON SHEET 11

Figure 2-125. Fuselage Sealing (Sheet 8 of 11)

MISCELLANEOUS CABIN SEALING


33
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31
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38
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37
35
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16
36

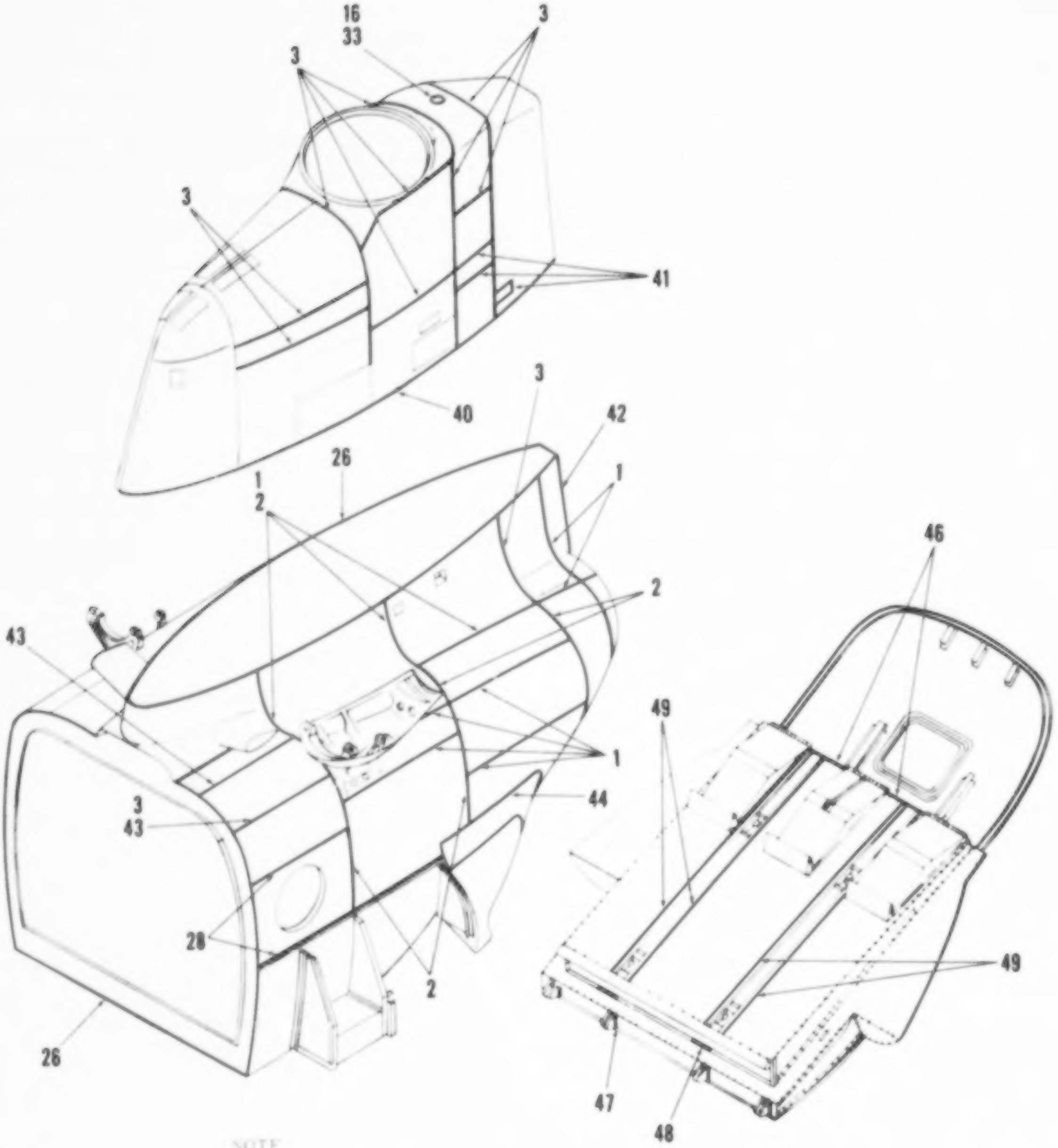
NOTE

INDEX NUMBERS RELATE TO SEALING LEGEND ON SHEET 11

B114-348-3550

Figure 2-125. Fuselage Sealing (Sheet 9 of 11)

AFT FUSELAGE, AFT PYLON, AND RAMP SEALING


16
33
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41
40
3
42
26
1
2
1
2
43
2
49
1
3
43
44
46
28
2
49
26
47
48

NOTE

INDEX NUMBERS RELATE TO SEALING
LEGEND ON SHEET 11

B-4-349-3550

Figure 2-125. Fuselage Sealing (Sheet 10 of 11)

SEALING LEGEND

1 FAYING SURFACE SEALANT BETWEEN SKIN LAP

2 FAYING SURFACE SEALANT BETWEEN SKIN AND FORMER AND/OR FINGERPLATE

3 FILLET SEAL ALONG EDGE OF SKIN LAP OR BUTT

4 FILLET SEAL AROUND WINDSHIELD WIPER POST

5 FILLET SEAL AROUND PITOT TUBE. COVER FASTENER HEADS WITH SEALING COMPOUND

6 FAYING SURFACE SEALANT BETWEEN DOUBLER AND SKIN

7 FILLET SEAL AROUND SCREW HEADS

8 FILLET SEAL AROUND EDGE OF HINGE

9 FAYING SURFACE BETWEEN SKIN AND HINGE

10 FAYING SURFACE SEALANT ON FRAME AND PARTING AGENT ON WINDOW

11 FILLET SEAL AROUND FASTENER HEAD (16 PLACES)

12 FILLET SEAL AROUND GROMMET

13 FAYING SURFACE AND FILLET BETWEEN HOUSING AND INNER SKIN

14 FILLET SEAL AROUND ANTENNA

15 FILLET SEAL AROUND RECEPTACLE

16 COVER FASTENER HEADS WITH SEALING COMPOUND

17 FILLET SEAL AROUND TUBE RETAINER

18 FILLET SEAL AROUND JACK FITTING

19 FILLET SEAL AROUND GUY WIRE ATTACHMENT

20 HOLE FILLING COMPOUND

21 FAYING SURFACE SEALANT BETWEEN TEE AND ANGLE

22 FAYING SURFACE SEALANT BETWEEN PAN AND SKIN

23 FAYING SURFACE SEALANT BETWEEN SKIN AND STIFFENER

24 FILLET SEAL AROUND HEATER DUCT

25 FILLET SEAL AROUND EDGE OF SKIN CUTOUT AND TUBE. USE SEALANT (C304)

26 FAYING SURFACE SEALANT AND PARTING AGENT BETWEEN FORMERS

27 PREPACK SEALANT IN JOGGLE

28 FAYING SURFACE SEALANT BETWEEN BEAM AND SKIN

29 FAYING SURFACE SEALANT BETWEEN SKIN AND TEE

30 FAYING SURFACE SEALANT BETWEEN BEAM AND ANGLE WITH PARTING AGENT ON BEAM

31 FAYING SURFACE SEALANT BETWEEN SKIN AND SUPPORT

32 FILLET SEAL AROUND FLANGE

33 FILLET SEAL AROUND LIGHT

34 APPLY SEALANT TO FASTENER BEFORE INSTALLATION

42 x 41

35 FAYING SURFACE SEALANT TO BOTTOM OF PLATE

36 FAYING SURFACE SEALANT ON STANDOFF ATTACHING SURFACE

37 FILLET SEAL AROUND ENTIRE EDGE OF BLOCK

38 FILLET SEAL AROUND BOLT HEAD AND WASHER

39 APPLY PARTING AGENT TO EXPOSED SURFACES OF BOLT, NUT, AND, WASHER. APPLY SEALANT OVER PARTING AGENT

40 APPLY FILLET SEAL FROM STA 482 TO 630.50 AFTER JOINING CROWN PANEL AND PYLON

41 FAYING SURFACE SEALANT AND PARTING AGENT BETWEEN DOOR AND STRUCTURE

42 FAYING SURFACE SEALANT BETWEEN SKIN AND STRUCTURE

43 FAYING SURFACE SEALANT BETWEEN SKIN AND LONGERON

44 FAYING SURFACE SEALANT BETWEEN FAIRING AND STRUCTURE

45 FAYING SURFACE SEALANT BETWEEN SKIN AND ANGLE

46 MYLAR TAPE AND FAYING SURFACE SEALANT BETWEEN BEAM AND HINGE

47 HOLE FILLING COMPOUND UNDER EDGE OF WEB (TYP 4 PLACES)

48 MYLAR TAPE BETWEEN BEAM AND FORMER (TYP)

49 FAYING SURFACE SEALANT BETWEEN BEAM AND PLATE

50 FAYING SURFACE SEALANT BETWEEN SKIN AND ADAPTER (TYP)

51 FAYING SURFACE SEALANT BETWEEN SKIN AND DRAIN FITTING

52 FAYING SURFACE SEALANT BETWEEN SKIN AND CHANNEL

53 FAYING SURFACE SEALANT BETWEEN ADAPTER AND TEE CAP

54 FAYING SURFACE BETWEEN CHANNEL AND RETAINER

55 FAYING SURFACE SEALANT BETWEEN HINGE AND RETAINER

56 MYLAR TAPE ON FLOOR PANEL, ANGEL, AND/OR SPLICE PLATE WITH PARTING AGENT AND FAYING SURFACE SEALANT BETWEEN MYLAR TAPES

57 MYLAR TAPE ON BEAM

58 FAYING SURFACE SEALANT ON BEAM

59 APPLY MYLAR TAPE AS SHOWN

60 APPLY MYLAR TAPE AND FAYING SURFACE SEALANT AS SHOWN

61 FILLET SEAL AROUND RECEPTACLE

B114-351-34SV

Figure 2-125. Fuselage Sealing (Sheet 11 of 11)

2-560. Nonremovable Parts Faying Surface Sealing. Seal nonremovable faying surfaces as follows:

a. Prepare surfaces. Refer to para 2-556.

NOTE

Lightly sand wheel assembly bolthead faying surfaces with 400-grit, abrasive paper (C3 or C4) before performing step e. of para 2-556.

b. Apply sealing compound to one surface, using a caulking gun and suitable nozzle.

c. Assemble surfaces, using permanent fasteners.

NOTE

If permanent fasteners cannot be installed within the working life of sealing compound, use temporary fasteners.

d. Check for sealing compound squeezeout along edge of faying surfaces. The absence of squeezeout at any point along edge indicates insufficient sealant and is cause for rejection of assembly.

e. Replace temporary fasteners, if used, with permanent fasteners. Check tightened fasteners within 30 minutes after installation for retention of original torque. Adjust them as necessary.

2-561. Removable Parts Faying Surface Sealing. Seal removable faying surfaces as follows:

a. Prepare surfaces. Refer to para 2-556.

b. Apply parting agent (C236) to one of the faying surfaces.

c. Allow parting agent to dry and proceed with repair.

2-562. Fillet and Seam Sealing. Seal fillets and seams (See fig. 2-126) as follows:

a. Prepare surfaces. Refer to para 2-556.

b. Apply filler or seam with a caulking gun and suitable nozzle.

2-563. Gap and Joggle Sealing. Seal gaps or joggles (See fig. 2-126) as follows:

a. Prepare the gap or joggle. Refer to para 2-556.

b. Apply sealing compound, using a caulking gun and suitable nozzle. Apply sealant in one opening of area until it emerges from opposite opening.

NOTE

To make sure areas having three or more openings are completely filled, block off all openings between opposite openings.

2-564. Opening or Hole Sealing. Seal openings as follows:

a. Plug tool and coordination holes with type A rivets. Apply sealing compound to hole or rivet and set rivet.

b. Seal openings smaller than 0.1 inch in same manner as described for fillets and seams.

c. Seal openings between 0.1 and 0.5 inch. See fig. 2-126.

NOTE

For pressure sealing, the maximum opening allowed is ¼ inch. For weather sealing the maximum opening is ½ inch. If required, masking tape (C337) may be used on one side of opening to prevent excessive squeezeout of sealing compound.

2-565. Fastener Sealing. (Seal fasteners (see fig. 2-126) as follows:

a. Seal installed screws and rivets by applying sealing compound around base and over fastener to a minimum thickness of 1/16 inch. If fastener is not already installed, apply sealing compound to hole or fastener.

NOTE

Rivets BACR15DN and BACR15DP, may be substituted for rivets MS20470AD and MS20426AD, respectively. These rivets are precoated with sealing compound and do not require sealing at installation.

b. Seal blind rivets by dipping rivet into two-part sealing compound.

c. Seal lockbolts, Jo-bolts, and other bolts by applying sealing compound around base and over head to a minimum thickness of ⅛ inch.

d. Seal all other fasteners in a fashion similar to step (b) and (c).

2-566. Fasteners.

Para 2-567 thru 2-581 contain information on rivets, bolts, screws, nuts, washers, cotter pins, bushings, and structural fasteners (Delron or equivalent).

2-567. Rivets.

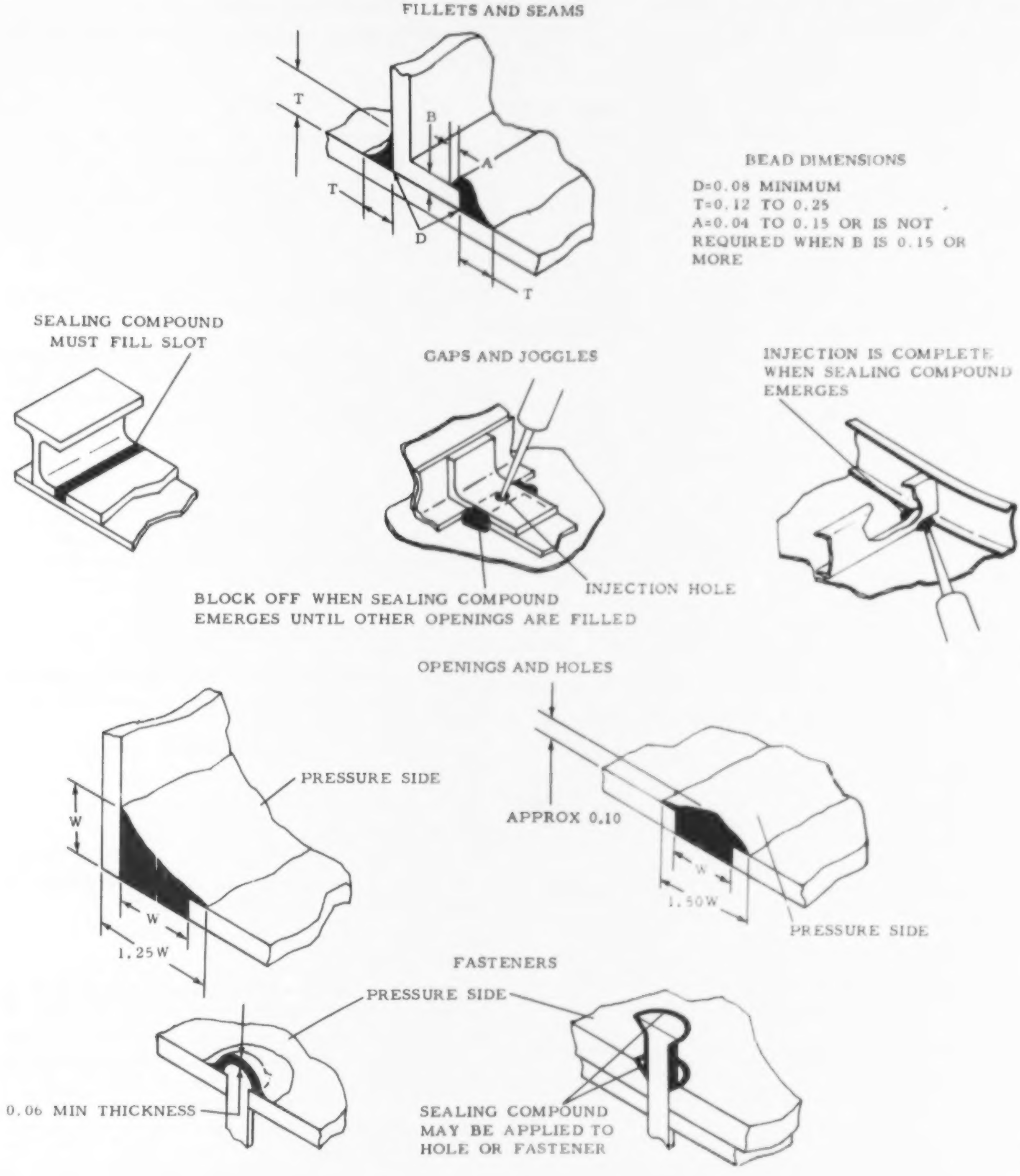
The procedures for riveting and the identification of rivets are found in TM 55-1500-204-25/1. (See fig. 2-127 for additional information on rivets including alloy selection, row distance, and pitch as may be necessary to accomplish repairs.)

2-568. Substitution of AN Bolts for AN Rivets.

AN bolts can be substituted for AN rivets within the following limitations: (Refer to table 2-20.)

a. Substitution is to be made only where rivets have been omitted and cannot be installed on assembly.

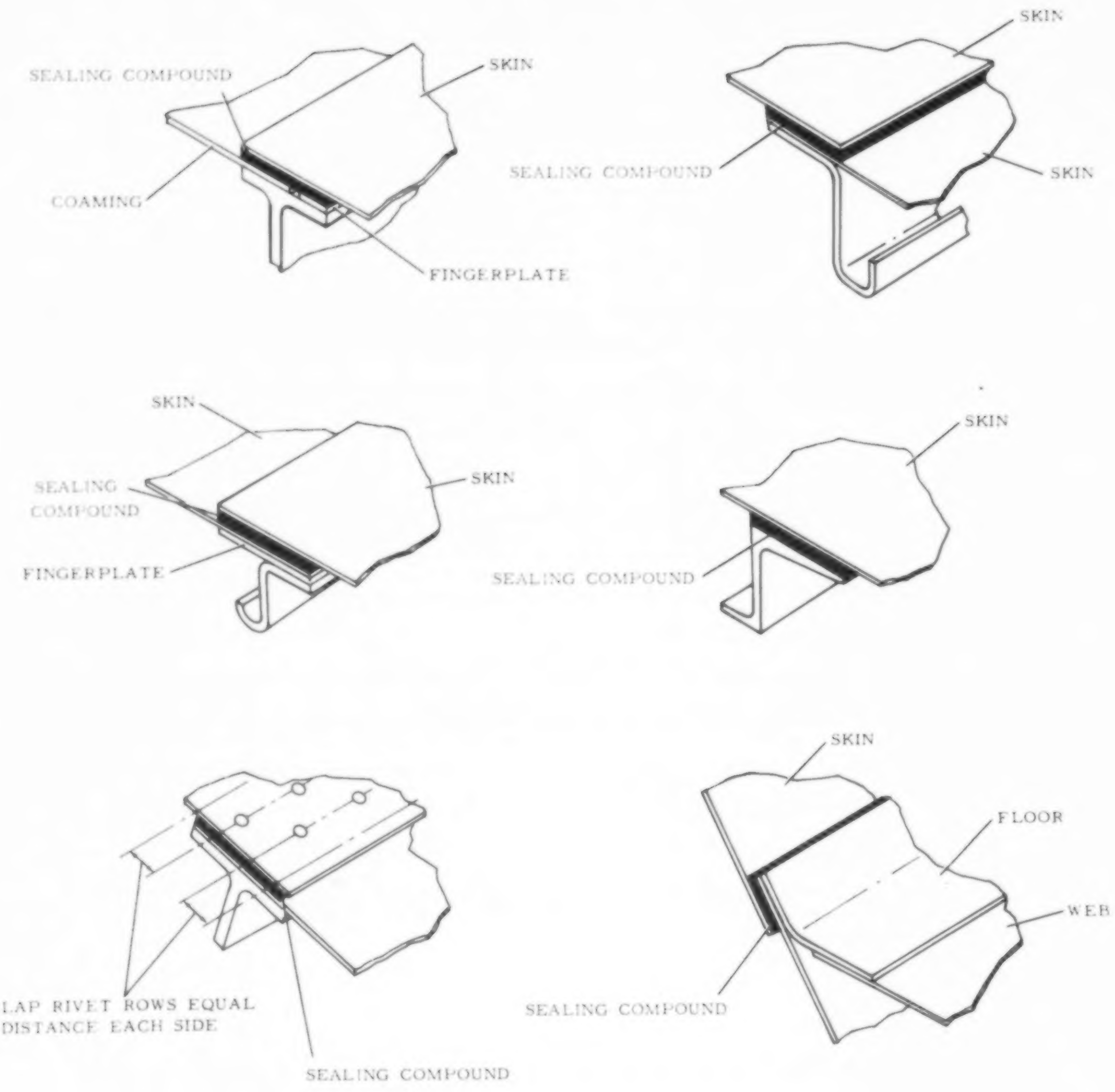
b. A minimum edge distance of 1½ times diameter of rivet can be used where space is limited. However, maintain, where possible, a minimum edge distance of two times diameter of rivet.


FILLETS AND SEAMS
T
B
A
T
D
T
BEAD DIMENSIONS
D=0.08 MINIMUM
T=0.12 TO 0.25
A=0.04 TO 0.15 OR IS NOT REQUIRED WHEN B IS 0.15 OR MORE
SEALING COMPOUND MUST FILL SLOT
GAPS AND JOGGLES
INJECTION IS COMPLETE WHEN SEALING COMPOUND EMERGES
INJECTION HOLE
BLOCK OFF WHEN SEALING COMPOUND EMERGES UNTIL OTHER OPENINGS ARE FILLED
OPENINGS AND HOLES
PRESSURE SIDE
W
W
1.25W
APPROX 0.10
W
1.50W
PRESSURE SIDE
FASTENERS
PRESSURE SIDE
0.06 MIN THICKNESS
SEALING COMPOUND MAY BE APPLIED TO HOLE OR FASTENER

NOTE
ALL DIMENSIONS ARE SHOWN IN INCHES UNLESS OTHERWISE NOTED

B114-32-355A

Figure 2-126. Application of Sealants (Sheet 1 of 2)


NONREMOVABLE AND REMOVABLE FAYING SURFACES

SEALING COMPOUND
SKIN
COAMING
FINGERPLATE
SKIN
SEALING COMPOUND
SKIN
SKIN
SEALING COMPOUND
SKIN
FINGERPLATE
SKIN
SEALING COMPOUND
LAP RIVET ROWS EQUAL DISTANCE EACH SIDE
SEALING COMPOUND
SKIN
FLOOR
WEB
SEALING COMPOUND

B114-33-355

Figure 2-126. Application of Sealants (Sheet 2 of 2)

RIVET SELECTION AND SPACING WHEN REPAIRING ALUMINUM ALLOY PARTS

GAGE OF THICKEST PIECE	TYPE OF REPAIR RIVET		PITCH		ROW DISTANCE
	STANDARD	BLIND	MINIMUM	MAXIMUM	
0.020	* 3	** 4	0.375	0.500	0.437
0.025	* 4	** 5	0.500	0.625	0.500
0.032	* 4	** 5	0.562	0.687	0.500
0.040	* 5	** 6	0.687	0.812	0.625
0.051	* 5	** 6	0.687	0.750	0.562
0.064	*** 6	** 6	0.812	1.062	0.625
0.072	*** 6	** 6	0.750	1.062	0.687
0.081	*** 6	** 6	0.625	0.937	0.687
0.091	*** 6	** 6	0.625	0.750	0.687
0.102	10	** 6	1.562	1.812	0.875
0.250	10	--	1.187	1.375	0.875

* MS20470AD OR MS20426AD
** MS20600AD OR MS20601AD

*** MS20470DD OR MS20426DD
AN HEX HEAD BOLT OR STEEL
LOCKBOLTS (HUCK MFG. CO.)

RIVET SELECTION AND SPACING WHEN REPAIRING CORROSION-RESISTANT STEEL PARTS

GAGE OF THICKEST PIECE	TYPE OF REPAIR RIVET		PITCH		ROW DISTANCE
	STANDARD	BLIND	MINIMUM	MAXIMUM	
0.024	* 4	** 5	0.562	0.687	0.500
0.030	* 4	** 5	0.437	0.562	0.500
0.036	* 5	** 6	0.750	0.875	0.625
0.042	* 5	** 6	0.687	0.812	0.625
0.042	* 6	** 6	0.875	1.00	0.687
0.060	* 6	** 6	0.812	1.062	0.687

* MS20615M OR MS20427M
** MS20600M OR MS20601M

RIVET SELECTION AND SPACING WHEN REPAIRING MAGNESIUM ALLOY PARTS

GAGE OF THICKEST PIECE	TYPE OF REPAIR RIVET		PITCH		ROW DISTANCE
	STANDARD	BLIND	MINIMUM	MAXIMUM	
0.020	* 3	** 4	0.375	0.500	0.437
0.025	* 4	** 5	0.500	0.625	0.500
0.032	* 4	** 5	0.562	0.687	0.500

* MS20470B OR MS20426B
** MS20600B OR MS20601B

NOTES

A. ALL DIMENSIONS ARE SHOWN IN INCHES UNLESS OTHERWISE NOTED

B. WHEN INSTALLING FLUSH-TYPE RIVETS, MATERIAL MUST BE DIMPLE COUNTERSUNK IF 0.063 OR THINNER, AND MACHINE COUNTERSUNK IF THICKER THAN 0.063

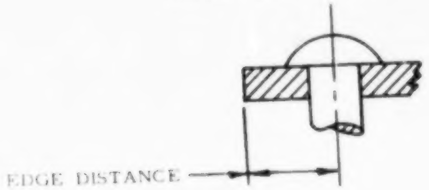
C. MAINTAIN 2D EDGE DISTANCE WHEN INSTALLING ALL RIVETS. SEE SHEET 2 OF THIS FIGURE FOR MINIMUM ACCEPTABLE EDGE DISTANCE

B114-89-355

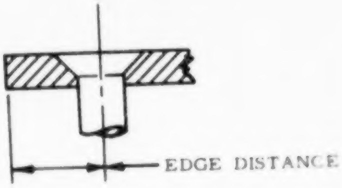
Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 1 of 6)

MINIMUM ACCEPTABLE RIVET EDGE DISTANCES FOR ALUMINUM ALLOY RIVETS

MS20470AD OR MS20470DD



MS20426AD OR MS20426DD



MINIMUM RIVET EDGE DISTANCES

RIVET DIA IN 32NDS / SHEET THICKNESS	NONFLUSH-TYPE RIVETS				FLUSH - TYPE RIVETS			
	3	4	5	6	3	4	5	6
0.020	0.156	0.218	0.265	--	0.187	0.281	0.328	--
0.025	0.156	0.218	0.265	0.328	0.187	0.281	0.328	0.390
0.032	0.140	0.218	0.265	0.328	0.171	0.281	0.328	0.390
0.040	0.125	0.187	0.234	0.328	0.156	0.250	0.328	0.390
0.051	0.109	0.156	0.203	0.312	0.140	0.218	0.296	0.375
*0.064	--	0.140	0.187	0.265	--	0.203	0.265	0.328
*0.072	--	0.140	0.171	0.250	--	0.203	0.250	0.312
*0.081	--	0.125	--	0.234	--	--	0.234	0.296
*0.102	--	--	--	0.203	--	--	--	0.265

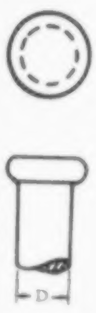
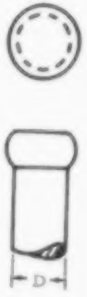
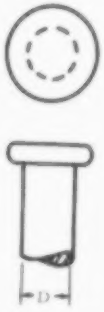
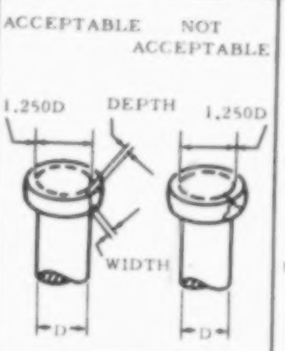
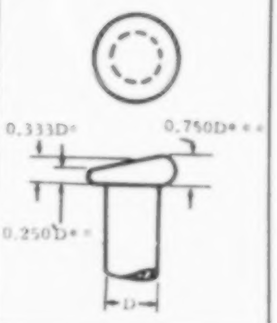
* USE MS20470DD OR MS20426DD RIVETS

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. MINIMUM EDGE DISTANCES SHOWN ARE APPLICABLE ONLY TO ROWS OF RIVETS CONTAINING THREE OR MORE RIVETS, AND FURTHER LIMITED TO A MAXIMUM OF 30 PERCENT OF TOTAL RIVETS IN A ROW

Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 2 of 6)

ACCEPTABILITY LIMITS

RIVET DIA IN 32NDS	DIMENSIONS OF SHOP HEAD						CRACKED HEADS	COCKED (BEVELED) HEADS	
	NOMINAL								
	DIAMETER 1.5D	HEIGHT 0.5D	MINIMUM DIAMETER 1.333D	MAXIMUM HEIGHT 0.666D	MAXIMUM DIAMETER 1.666D	MINIMUM HEIGHT 0.333D		MINIMUM **	MAXIMUM ***
	COND 1		COND 2		COND 3		COND 4	COND 5	
3	0.141	0.047	0.122	0.062	0.157	0.031	REFER TO NOTE D.	0.023	0.070
4	0.188	0.063	0.163	0.083	0.208	0.042		0.031	0.094
5	0.234	0.078	0.203	0.104	0.260	0.052		0.039	0.117
6	0.281	0.094	0.245	0.125	0.312	0.063		0.047	0.141
8	0.375	0.125	0.325	0.167	0.416	0.083		0.063	0.188
10	0.469	0.156	0.406	0.208	0.520	0.104		0.078	0.235
12	0.562	0.188	0.487	0.250	0.625	0.125		0.094	0.281
LIMITING DEFECT							 ACCEPTABLE NOT ACCEPTABLE 1.250D DEPTH 1.250D WIDTH D D		
REMARKS			RIVETS NOT CONFORMING TO THE ABOVE LIMITATIONS CAN BE RESTRUCK ON SHOP HEAD IF HEAD THICKNESS PERMITS, REFER TO NOTE B.				REFER TO NOTE D.	MEAN HEIGHT CANNOT BE LESS THAN 0.333D	

* MEAN HEIGHT OF SHOP HEAD ** HEIGHT OF SHOP HEAD AT THINNEST PART *** HEIGHT OF SHOP HEAD AT THICKEST PART

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. DO NOT RESTRIKE TYPE DD RIVETS AFTER INITIAL DRIVING

C. THE LIMITS SHOWN ARE THE MINIMUM ALLOWABLE AND SHALL NOT BE APPLIED TO DYNAMICALLY BALANCED COMPONENTS

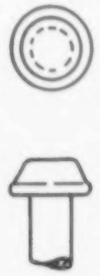
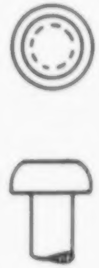
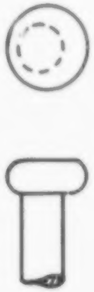
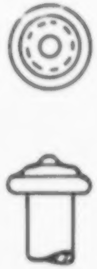
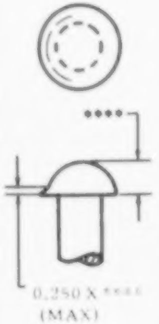
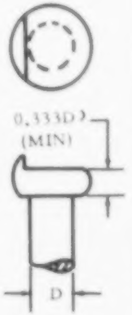
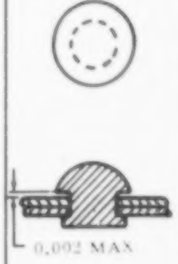
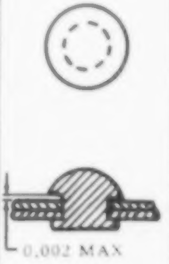
D. SEE SHEET 6 OF THIS FIGURE FOR CLARIFICATION OF CRACKED HEADS AND APPLICABLE ACCEPTABLE LIMITS

54x39

B114-91-345

Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 3 of 6)

ACCEPTABILITY LIMITS

COND	CONCENTRIC STEPPED OR TRUNCATED CONICAL HEAD	FLATTENED HEAD	OFFSET HEAD	CONCENTRIC RINGED HEAD	CUT HEAD	STEPPED HEAD	INCOMPLETELY DRIVEN (OPEN) HEAD	OPEN HEAD (TILTED)
	COND 6	COND 7	COND 8	COND 9	COND 10	COND 11	COND 12	COND 13
LIMITING DEFECT					 	 	 	
REMARKS	CAN BE USED FOR SHOP HEAD AND RIVET DIA. 0.1875 AND GREATER	THE USE OF A FLAT SET IS PERMITTED ON THE MANUFACTURED HEAD	THE HEAD CAN BE TANGENT TO THE SHANK. NOT ACCEPTABLE IF THE HOLE SHOWS OR FOR USE IN SECTION OF INTEGRAL TANKS	NOT ACCEPTABLE. PROBABLY CAUSED BY THE USE OF A SMALL RIVET SET	MAX. DEPTH IS 1/4 HEAD HEIGHT	STEPPED PART OF HEAD TO BE NOT LESS THAN ALLOWABLE MINIMUM HEAD THICKNESS. NOT NECESSARY TO CHIP OR FILE THE HIGH PART	NOT ACCEPTABLE IF RIVET IS LOOSE OR IF A 0.002 FEELER GAGE CAN BE INSERTED TO SHANK. RIVET CAN BE RESTRUCK TO REDUCE CLEARANCE NOT ACCEPTABLE FOR USE IN SECTIONS OF INTEGRAL TANKS. REFER TO NOTE B.	

HEIGHT OF MANUFACTURED HEAD

NOTES

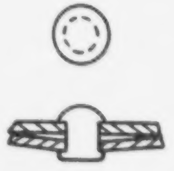
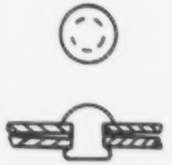
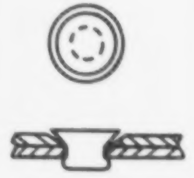
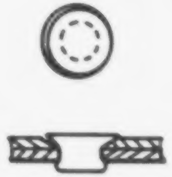
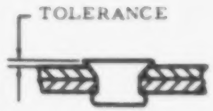
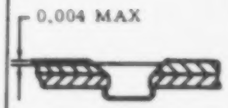
A. ALL DIMENSIONS ARE IN INCHES
B. DO NOT RESTRIKE TYPE DD RIVETS

54x39

B114-92 34S

Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 4 of 6)

ACCEPTABILITY LIMITS

CONDITION	SWELLED RIVET (SHEET BUCKLED AT RIVET)		OPEN	PARTIALLY OPEN	PROJECTING HEAD	DEPRESSED HEAD
	INTERNAL GAP	OPEN GAP	COUNTERSUNK RIVET	COUNTERSUNK RIVET	COUNTERSUNK RIVET	COUNTERSUNK OR DIMPLED RIVET
	COND 14	COND 15	COND 16	COND 17	COND 18	COND 19
LIMITING DEFECT						
REMARKS	ACCEPTABLE IF CASE IS ISOLATED. LIMITED TO NOT MORE THAN THREE NON-CONSECUTIVE RIVETS IN A ROW OF TEN RIVETS	RESTRIKE IF A 0.003 FEELER GAGE CAN BE INSERTED TO SHANK. IF THIS DOES NOT CORRECT, REMOVE RIVET AND CLEAN OUT CHIPS. MAX EDGE GAP 0.015. OPEN GAP NOT ACCEPTABLE IN INTEGRAL TANK SECTIONS. REFER TO NOTE B.	NOT ACCEPTABLE. IF SKIN THICKNESS PERMITS, REMOVE RIVET AND RECOUNTER-SINK FOR NEXT LARGER DIAMETER. IF APPROVED EQUIPMENT IS AVAILABLE, THE SHOP HEAD CAN BE FORMED IN THE COUNTERSINK AND ANY PROJECTION SHAVED FLUSH		TYPICAL MAXIMUM TOLERANCE IS 0.004. SPECIFIC TOLERANCES ARE DEPENDENT UPON LOCATIONS	REPLACE RIVET IF HEAD IS MORE THAN 0.004 BELOW SURFACE. IF MACHINE COUNTERSUNK AND SKIN THICKNESS PERMITS, REPLACE WITH NEXT LARGER DIAMETER RIVET. FORM SHOP HEAD OF REPLACEMENT RIVETS IN THE COUNTERSINK

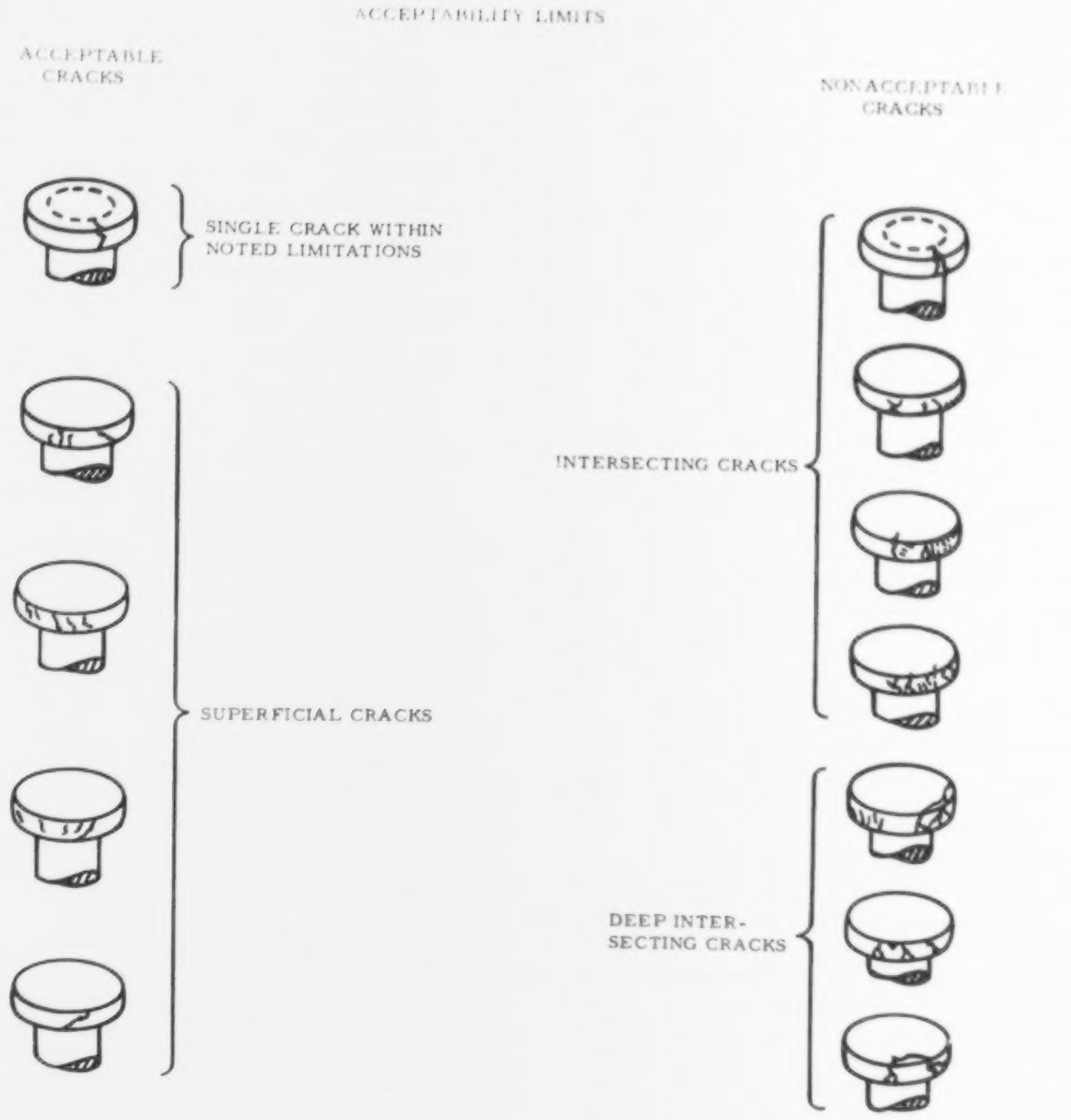
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. DO NOT RESTRIKE TYPE DD RIVETS

54x39

8114-93-345

Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 5 of 6)


ACCEPTABILITY LIMITS
ACCEPTABLE CRACKS
NONACCEPTABLE CRACKS
SINGLE CRACK WITHIN NOTED LIMITATIONS
SUPERFICIAL CRACKS
INTERSECTING CRACKS
DEEP INTERSECTING CRACKS

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. CRACKED HEADS ARE ACCEPTABLE UNDER THE FOLLOWING CONDITIONS:

1. DEPTH OF CRACK LESS THAN 1/8 THE SHANK DIAMETER
2. WIDTH OF CRACK LESS THAN 1/16 THE SHANK DIAMETER
3. LENGTH OF CRACK CONFINED TO AN AREA ON THE HEAD WITHIN A CIRCLE HAVING A MINIMUM DIAMETER OF 1-1/4 TIMES THE SHANK DIAMETER
4. CRACKS SHOULD NOT INTERSECT TO FORM A POTENTIAL CAUSE FOR THE LOSS OF A PORTION OF THE HEAD

42x51

B114.94 34SM

Figure 2-127. Rivet Spacing, Selection, and Acceptability Limits (Sheet 6 of 6)

Table 2-20. Substitution for AN Rivets

RIVET ALLOY AND DIA	BOLT SIZE SUBSTITUTION
AD4, 5, 6	AN3 or AN23
AD8	AN4DD or AN24
AD10	AN5DD or AN25
AD12	AN6DD or AN26

2-569. Installation of AN Bolts.

a. Open rivet hole to same diameter of bolt as noted in table 2-20, and maintain a light drive fit.

b. Install washers AN960 and nuts MS20364 as required. Nuts MS20365 can be substituted for nuts MS20364.

2-570. Substitutions for Huck, Hi-Lok, and NAS Bolts.

These bolts can be replaced by the bolts listed in table 2-21. Diameter dash numbers for all bolts are the same. The hole sizes shown in table 2-21 are applicable to all installations where high-shear capability is required. An exception to this high-shear capability is the hardware installed in the body structure maintenance splices at sta 160.219 and 439.71.

2-571. Substitution for Jq-Bolts and V-Bolts.

These bolts can be replaced by the bolts listed in table 2-22. Jo-Bolts are numbered in relation to their diameter. The asterisk denotes the length dash number. This type fastener is used primarily in blind installations.

2-572. Substitution of Standard Bolts for Huck Bolts.

Standard bolts or screws may be substituted for Huck bolts provided the following condition and criteria are met:

a. Use standard bolts or screws only when Huck bolts or equivalent fasteners are not available.

b. The hole diameter must be large enough not to interfere with threads of the bolts, but small enough to provide an interference fit between hole and shank of bolt.

Table 2-21. Huck and Hi-Lok Bolt Substitution

HUCK PART NO.	HI-LOK PART NO.	NAS PART NO.	HOLE DIA (INCHES)
R3001-5	HL18-5	NAS1465	0.161 to 0.164
R3001-6	HL18-6	NAS1466	0.185 to 0.188
R3001-8	HL18-81	NAS1468	0.242 to 0.246
R3001-10	HL18-10	NAS1470	0.307 to 0.310
R3002-5	HL21-5	—	0.161 to 0.164
R3002-6	HL21-6	NAS1956	0.185 to 0.188
R3002-8	HL21-8	NAS1458	0.242 to 0.246
R3002-10	HL21-10	NAS1460	0.307 to 0.310

c. When bolts are used to replace Huck bolts used in shear applications the following series bolts can be used; NAS1103, NAS1303, NAS464, NAS624 and Hi-lok HL-18.

When bolts are used to replace Huck bolts used in tension applications use NAS624 series bolts (use NAS1303 for replacement of 3/16 inch diameter Huck bolts used in tension).

Table 2-22. Jo- and V-Bolt Substitution

JO-BOLT PART NO.	V-BOLT PART NO.	HOLE DIA (INCHES)
WP 164	BA5A*H	0.164 to 0.168
WP 200	BA6A*H	0.199 to 0.203
WP 260	BA8A*H	0.261 to 0.265
WP 312	BA10A*H	0.313 to 0.317
WF 164	BA5A*F	0.164 to 0.168
WF 200	BA6A*F	0.199 to 0.203
WF 260	BA8A*F	0.261 to 0.265
WF 312	BA10A*F	0.313 to 0.317

d. Under emergency conditions, any steel bolt or screw of the same nominal diameter as the hole, having a tensile strength of 125,000 psi may be used, provided it is replaced with the correct fastener within 25 flight hours.

2-573. Bolts and Screws.

Refer to TM 55-1500-204-25/1.

2-574. Bolt and Screw Replacement and Substitution.

Allowable replacement practices and substitutions are described in the following steps:

a. AN standard hex head or clevis bolts can be substituted for screws AN525. However, no substitution is permitted for AN standard hex head or clevis bolts.

b. Aluminum alloy bolts must not be substituted for steel screws.

2-575. Bolt Hole Criteria.

It is important that the fit of bolts and screws be maintained as specified. Before replacing fittings which were originally attached by bolts, the holes in both the fitting and the structure should be examined for possible enlargement or elongation. Enlarged or elongated holes will necessitate replacement of fitting or supporting member, unless oversize bolts can be installed. Oversize bolts, 0.0625 inch larger in diameter than original bolts, can be used provided that: (1) only one oversize bolt is used in any one location; (2) proper edge distance can be maintained. Table 2-23 lists information on fit of bolts and screws and should be used as a guide in repair of this helicopter.

2-576. Nuts, Washers, and Cotter Pins.

A nut and bolt used together should be of the same alloy and if damaged should be replaced by a nut and bolt of same size, type specification, and heat treatment as original. Aluminum alloy washers should be used under aluminum alloy nuts and bolts. Aluminum alloy washers should be used under steel nuts and bolts attaching aluminum alloy parts only when bolt is used in shear or a controlled torque is not required. Cadmium plated steel washers should be used under steel nuts and bolts attaching steel parts, and under steel nuts and bolts attaching

Table 2-23. Information on Bolts and Screws

DESCRIPTION	STANDARD PART NUMBER	SIZE	DIAMETER	HOLE SIZE FIT I LOOSE DRILL		HOLE SIZE FIT II CLOSE DRILL		HOLE SIZE FIT III REAM		HOLE SIZE FIT IV REAM (SPECIAL)		MINIMUM SPACING	MINIMUM EDGE DISTANCE*
Washer Head Screws	AN525-10	10-32	0.190	0.201	−0.000 +0.006	0.191	−0.000 +0.006	0.190	−0.0005 +0.0005	—		11/16	3/8
	AN525-416	1/4-28	0.250	0.261	−0.000 +0.007	0.250	−0.000 +0.007	0.250	−0.0005 +0.0005	—		3/4	1/2
Counter-Sunk Head Screws	NAS-213	10-32	0.189	0.2031	−0.002 +0.004	0.191	−0.002 +0.006	—		—		11/16	3/8
	NAS-214	1/4-28	0.249	0.2656	−0.002 +0.005	0.250	−0.000 +0.007	—		—		3/4	1/2
	NAS-215	5/16-24	0.3115	0.3281	−0.002 +0.005	0.3125	−0.000 +0.007	—		—		—	—
	NAS-216	3/8-24	0.3740	0.3906	−0.002 +0.005	0.375	−0.000 +0.007	—		—		—	—
Hex Head Bolts	AN3	10-32	0.189	0.201	−0.000 +0.006	0.191	−0.000 +0.006	0.190	−0.0005 +0.0005	—		11/16	3/8
	AN4	1/4-28	0.249	0.261	−0.000 +0.007	0.250	−0.000 +0.007	0.250	−0.0005 +0.0005	—		3/4	1/2
	AN5	5/16-24	0.312	0.323	−0.000 +0.007	0.3125	−0.000 +0.007	0.3125	−0.0005 +0.0005	—		—	—
	AN6	3/8-24	0.374	0.386	−0.000 +0.007	0.375	−0.000 +0.007	0.375	−0.0005 +0.0005	—		—	—
	AN7	7/16-20	0.437	0.4531	−0.000 +0.000	0.4375	−0.000 +0.007	0.4375	−0.0005 +0.0005	—		—	—
	AN8	1/2-20	0.499	0.5156	−0.000 +0.008	0.500	−0.000 +0.008	0.500	−0.0005 +0.0005	—		—	—
	AN9	9/16-18	0.562	0.5781	−0.000 +0.008	0.5625	−0.000 +0.008	0.5625	−0.0005 +0.0005	—		—	—
	AN10	5/8-18	0.624	0.6406	−0.000 +0.008	0.625	−0.000 +0.008	0.625	−0.0005 +0.0005	—		—	—
	AN12	3/4-16	0.749	0.7656	−0.000 +0.010	0.750	−0.000 +0.010	0.750	−0.0005 +0.0005	—		—	—
Clevis Head Bolts	AN23	10-32	0.186	0.199	−0.000 +0.006	0.189	−0.000 +0.006	0.1875	−0.0010 +0.0005	0.1865	−0.0000 +0.0005	11/16	3/8
	AN24	1/4-28	0.248	0.257	−0.000 +0.007	0.250	−0.000 +0.007	0.250	−0.0015 +0.0005	0.2485	−0.0000 +0.0005	3/4	1/2
	AN25	5/16-24	0.311	0.323	−0.000 +0.007	0.3125	−0.000 +0.007	0.3125	−0.0010 +0.0005	0.3115	−0.0000 +0.0005	—	—
	AN26	3/8-24	0.373	0.386	−0.000 +0.007	0.375	−0.000 +0.007	0.375	−0.0015 +0.0005	0.3735	−0.0000 +0.0005	—	—

*Minimum edge distance applies only to sheet construction.

FIT I	Used to attach brackets and accessories, or where several bolts attach sheet or plate material.
FITII	Used in primary structure where several bolts are used in a rigid joint.
FIT III	Used where one or two bolts are subject to reversible loads, vibration, or both.
FIT IV	Used where minimum clearance is to be maintained and units subjected to shear loads.

aluminum alloy parts when bolt is in tension or a controlled torque is required. The use of steel spring washers a second time is permissible when replacements are not available. Cotter pins must not be reused.

2-577. Bushings — Standard.

Damaged or worn bushings, especially those attaching moving parts, should be replaced with new bushings of the same type, material, and heat treatment as original. The correct length and internal and external diametrical tolerance are necessary for proper fit.

2-578. Bushings — Oversize (AVIM).

Plain or shouldered nonstandard bushings may be installed in discrepant bushing holes except flight and engine control parts where a minimum edge distance cannot be maintained. The following parts must be rebushed as directed in referenced paragraph:

Control Components	11-90, 5-155, 5-156, 11-216 and fig. 11-79, sheet 2
Engine mounts	4-73 and 4-80
Support assembly	2-487 and fig. 2-115, sheet 6

2-579. Plain Bushings (AVIM). Install plain, oversize, nonstandard bushings in discrepant bushing holes as follows:

a. Drill and ream hole to receive oversize bushing.

NOTE

Oversize bushings are limited to a 0.030 inch maximum increase in outside diameter. Make bushing from material of same type, hardness, and finish as original bushing.

b. Install bushing maintaining original fit.

2-580. Shouldered Bushings (AVIM). Install shouldered, oversize, nonstandard bushings in discrepant bushing holes within the limitations in subsequent steps:

a. Drill and ream hole to receive bushing.

NOTE

Oversize shouldered bushings are limited to a 0.015 inch maximum increase in outside diameter of shank. Increase outside diameter of shoulder by same amount as shank. Make bushing from material of same type, hardness, and finish as original bushing.

b. Install bushing, maintaining original fit.

2-581. Structural Fasteners — Delron or Equivalent.

Refer to TM 55-1500-204-25/1.

2-582. Extrusions.

The die number of the original extrusion, a sectional view, and dimensions of a corresponding formed replacement are shown in fig. 2-128. All dimensions shown in fig. 2-128 are in inches unless otherwise noted. When a replacement is not listed, an extruded section having the same die number as the original extrusion should be used.

2-583. Damage Classification.

Following inspection, damage which is classified as negligible, is described in para 2-584.

2-584. Negligible Damage. Damage which can be permitted to exist as is, or can be corrected by a simple procedure, such as removing dents and small damaged area, stop-drilling cracks, and the plugging of small holes is permissible. See fig. 2-8 for examples of negligible damage to extruded parts. Nicks, scratches, and small damaged areas can be removed by burnishing, provided the dimensions shown in fig. 2-8 are maintained. The depth, after burnishing, must not be greater than 10 percent of the thickness of the thinnest leg of the extrusion. Punctures, rough dents, cracks, and nicks and scratches, which exceed the maximum burnished depth, are negligible only if they can be cleaned out as a round hole which can be classified as negligible. Plug all negligible damage holes 3/16-inch diameter or over with a tight-fitting rivet or bolt. Holes, plugged or open, and burnished areas, must clear all radii, and must clear all fasteners a minimum of ¾ inch. Smooth dents not exceeding the maximum burnished depth and a maximum of ½-inch diameter are negligible. Two adjacent dents to be classified as negligible must be separated by a 4-inch length of undamaged original extrusion. Measure the distance at the edges of the burnished areas. Apply two coats of zinc chromate primer (C259) to burnished areas and edges of holes.

CAUTION

The use of heat to remove a dent is not permitted as the properties of the original part may be altered.

2-585. Tapes.

Para 586 thru 588 contain information on the various tapes used on the structure and component parts.

2-586. Application of Antichafing Tape.

This tape provides a smooth, nonabrasive surface over rivet heads and seams.

CAUTION

Exposure of antichafing tape (C333) to sunlight for 4 hours will destroy its adhesive qualities. Store unused tape in a cool dark area.

a. Remove all burrs, rough and sharp edges, and loose primer in area to be taped.

b. Using an air blast, brush or dry cloth, remove loose metal chips, dust, and primer scale.

c. Using a cloth (C104) moist with naphtha (C218) wipe all surfaces to be taped.

NOTE

Solvent (C137) may be substituted for naphtha. The solvent must be wiped dry and not allowed to evaporate on surfaces.

d. Repeat step c. at least two times or until the surfaces are clean.

e. Cut a length of tape as follows:

(1) If protrusions are less than ¼-inch high, the tape should be cut to extend 1 to 2 inches each side of protrusion.

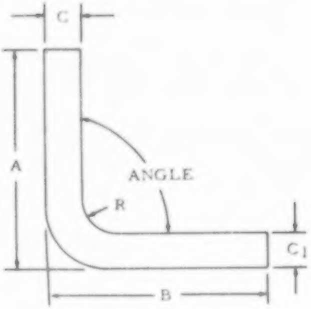
(2) If protrusions are higher than ¼-inch, the tape should be cut to extend 1½ to 2 inches each side of protrusion.

NOTE

Lengths of tape should be cut to allow protective paper liner to extend beyond cut edge. This will make it easier to remove tape. Continuous lengths of tape should be used wherever possible.

f. Remove liner from tape.

STANDARD ANGLES



ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)					
	A	B	C	C_1	R	ANGLE
AND10133-0601	0.750	0.750	0.063	0.063	0.094	90°
-0602	0.750	0.750	0.094	0.094	0.094	90°
-0603	0.750	0.750	0.125	0.125	0.094	90°
-0701	0.875	0.875	0.063	0.063	0.094	90°
-1001	1.000	1.000	0.063	0.063	0.188	90°
-1002	1.000	1.000	0.094	0.094	0.188	90°
-1201	1.250	1.250	0.063	0.063	0.188	90°
-1202	1.250	1.250	0.094	0.094	0.188	90°
-1203	1.250	1.250	0.125	0.125	0.188	90°
-1404	1.500	1.500	0.188	0.188	0.188	90°
-2003	2.000	2.000	0.188	0.188	0.250	90°
-3002	3.000	3.000	0.250	0.250	0.250	90°
AND10134-0501	0.500	0.625	0.050	0.050	0.063	90°
-0601	0.500	0.750	0.063	0.063	0.063	90°
-0701	0.625	0.875	0.063	0.063	0.125	90°
-0702	0.750	0.875	0.062	0.062	0.125	90°
-1003	0.750	1.000	0.063	0.063	0.125	90°
-1005	0.875	1.000	0.063	0.063	0.125	90°
-1006	0.875	1.000	0.094	0.094	0.125	90°
-1201	0.750	1.250	0.063	0.063	0.125	90°
-1202	0.750	1.250	0.094	0.094	0.125	90°
-1204	1.000	1.250	0.063	0.063	0.125	90°
-1205	1.000	1.250	0.094	0.094	0.125	90°
-1401	0.750	1.500	0.094	0.094	0.156	90°
-1402	0.750	1.500	0.125	0.125	0.156	90°
-1403	1.000	1.500	0.094	0.094	0.156	90°
-1405	1.000	1.500	0.156	0.156	0.156	90°
-1406	1.250	1.500	0.094	0.094	0.156	90°
-1407	1.250	1.500	0.125	0.125	0.156	90°
-1408	1.250	1.500	0.156	0.156	0.156	90°
-1601	1.000	1.750	0.125	0.125	0.156	90°
-1602	1.250	1.750	0.125	0.125	0.172	90°
-1604	1.500	1.750	0.156	0.156	0.156	90°
-2001	1.000	2.000	0.125	0.125	0.156	90°
-2008	1.500	2.000	0.188	0.188	0.188	90°
-2401	1.250	2.500	0.156	0.156	0.188	90°
-2403	1.500	2.500	0.188	0.188	0.188	90°
-2405	1.750	2.500	0.156	0.156	0.188	90°
-2408	2.000	2.500	0.188	0.188	0.250	90°
ALCOA 78J	1.000	1.000	0.062	0.062	0.062	90°
734Q	3.000	5.000	0.375	0.375	0.375	90°
5401	0.750	0.750	0.062	0.062	0.062	90°
9484	0.787	0.787	0.079	0.079	0.126	90°

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Figure 2-128. Extruded Parts Replacement (Sheet 1 of 11)

STANDARD ANGLES (CONT)

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)					
	A	B	C	C_1	R	ANGLE
ALCOA 9802	0.750	0.750	0.050	0.050	0.050	90°
10854	0.625	0.625	0.040	0.040	0.062	90°
11638	1.500	1.750	0.094	0.094	0.094	90°
11820	1.000	1.750	0.080	0.080	0.094	90°
12883	0.625	0.750	0.051	0.051	0.062	90°
13637	0.625	0.625	0.051	0.051	0.062	90°
13816	1.750	3.500	0.094	0.094	0.156	90°
14202	1.500	1.625	0.156	0.080	0.156	90°
15820	0.750	0.750	0.075	0.075	0.075	90°
16869	0.750	0.875	0.125	0.125	0.062	90°
16871	1.250	2.312	0.094	0.094	0.094	90°
22477	0.750	0.750	0.040	0.040	0.062	90°
22509	0.750	1.000	0.040	0.040	0.062	90°
22526	0.750	1.000	0.050	0.050	0.125	90°
22653	0.875	1.250	0.062	0.062	0.188	90°
22878	0.750	0.875	0.060	0.060	0.062	90°
22885	0.750	1.000	0.062	0.062	0.062	90°
22892	0.750	1.000	0.094	0.094	0.094	90°
22990	0.750	1.500	0.062	0.062	0.125	90°
22991	0.750	1.750	0.062	0.062	0.125	90°
24761	1.750	2.562	0.094	0.094	0.094	98°
27076	0.750	1.250	0.062	0.062	0.062	90°
27778	1.000	2.000	0.094	0.094	0.125	90°
28144	1.437	2.500	0.072	0.072	0.125	90°
28546	0.600	0.700	0.040	0.040	0.060	90°
29222	1.000	1.250	0.188	0.188	0.094	90°
30022	0.750	1.125	0.062	0.062	0.062	90°
30145	1.750	3.812	0.500	0.188	0.188	90°
30201	1.000	2.500	0.156	0.156	0.180	90°
30796	1.000	1.125	0.125	0.125	0.125	90°
30934	1.000	1.500	0.062	0.062	0.062	90°
31177	1.750	2.200	0.125	0.125	0.125	90°
31683	0.875	1.125	0.109	0.109	0.094	90°
31823	1.125	3.875	0.250	0.188	0.188	90°
32155	1.250	2.000	0.188	0.188	0.188	84°
32975	0.880	0.940	0.070	0.125	0.125	90°
33811	1.000	1.000	0.125	0.125	0.125	90°
43821	1.250	1.500	0.250	0.125	0.125	90°
44076	0.750	0.750	0.051	0.051	0.062	90°
45827	1.125	1.125	0.072	0.072	0.062	90°
51406	0.750	0.875	0.094	0.094	0.094	90°
51919	1.000	1.000	0.070	0.100	0.100	90°
52735	0.750	1.250	0.051	0.051	0.062	90°
56066	1.000	1.125	0.062	0.062	0.125	90°
59148	1.500	4.100	0.250	0.150	0.200	90°
59195	1.420	1.750	0.064	0.064	0.090	90°
59409	1.000	1.000	0.050	0.050	0.060	90°
59574	1.000	1.000	0.125	0.188	0.062	90°
59810	1.000	2.350	0.250	0.100	0.250	90°
60242	1.000	1.700	0.070	0.070	0.090	90°
60278	1.250	1.640	0.200	0.080	0.125	90°
60654	1.000	1.750	0.156	0.156	0.156	90°
60806	0.875	1.500	0.078	0.078	0.125	90°
60830	1.000	1.060	0.156	0.094	0.125	90°
61971	1.000	2.000	0.050	0.050	0.094	90°
62564	0.875	0.875	0.078	0.078	0.094	90°
66428	1.000	1.300	0.078	0.078	0.125	90°
67576	1.000	1.000	0.156	0.156	0.156	90°
67580	0.750	0.750	0.050	0.050	0.050	90°

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Figure 2-128. Extruded Parts Replacement (Sheet 2 of 11)

STANDARD ANGLES (CONT)

ORIGINAL DIE NO.		EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)					
		A	B	C	C_1	R	ANGLE
ALCOA	67987	1.281	1.094	0.188	0.125	0.125	90°
	71369	1.000	1.000	0.071	0.071	0.130	90°
	76983	1.566	5.630	0.650	0.150	0.380	90°
	80759	1.000	1.125	0.190	0.090	0.093	90°
	80788	2.500	3.000	0.188	0.188	0.125	105°
HARVEY ALUMINUM	11301-3	1.000	1.000	0.094	0.125	0.125	90°
	15078	0.750	0.875	0.051	0.051	0.062	90°
	16119	1.000	1.250	0.060	0.130	0.120	90°
	16264	1.500	3.500	0.400	0.150	0.250	90°
	17335	1.000	1.250	0.125	0.080	0.125	90°
	17413	1.125	4.810	0.078	0.078	0.125	90°
	17716	0.875	1.000	0.078	0.078	0.125	90°
	21741	1.125	2.650	0.156	0.156	0.094	90°
REYNOLDS ALUMINUM	372	0.750	0.875	0.062	0.062	0.062	90°
	4165	2.100	0.875	0.250	0.250	0.160	90°
	5761	1.000	2.780	0.063	0.063	0.188	90°
	6033	1.000	0.750	0.060	0.115	0.120	90°
	7825	1.125	2.750	0.188	0.125	0.156	90°
	8158	2.312	2.000	0.125	0.125	0.125	90°
	8993	1.500	1.060	0.125	0.250	0.125	90°
	19273	0.875	1.250	0.070	0.070	0.062	90°
	19292	0.562	3.500	0.062	0.062	0.062	90°
	26807	1.063	2.000	0.125	0.125	0.063	90°
TEXAS ALUMINUM	T-2070	1.000	1.188	0.063	0.120	0.125	90°
VERTOL STANDARD	90104	1.620	1.060	0.290	0.150	0.120	90°
	90109	1.250	0.875	0.125	0.078	0.060	90°
	90110	1.310	2.000	0.078	0.078	0.125	90°
	90112	1.250	1.440	0.187	0.078	0.125	90°
	90114	1.420	1.560	0.094	0.188	0.156	90°
	90115	1.380	1.380	0.125	0.078	0.125	90°
	90116	2.500	2.500	0.125	0.125	0.125	108°
	90117	1.640	1.237	0.188	0.188	0.188	84°
	90118	1.640	1.262	0.188	0.188	0.188	81°
	90119	0.980	1.400	0.060	0.130	0.130	69°
	BAC1503-1420	0.750	0.750	0.040	0.040	0.062	90°
	-2731	1.000	1.000	0.062	0.062	0.062	90°
	-100019	1.250	1.000	0.156	0.156	0.156	90°
	-100037	1.750	1.420	0.064	0.064	0.090	90°
	-100043	1.000	0.830	0.070	0.070	0.060	90°
	BAC1514-157	1.500	3.000	0.250	0.188	0.188	90°
	-539	1.000	2.188	0.094	0.094	0.156	86°30'

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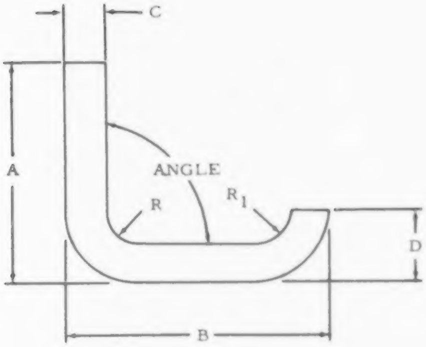
Figure 2-128. Extruded Parts Replacement (Sheet 3 of 11)

BULB ANGLES



ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)						
	A	B	C	D	R	R_1	ANGLE
AND10135-1002	0.750	1.000	0.063	0.250	0.094	0.094	90°
-1004	0.875	1.000	0.078	0.078	0.117	0.117	90°
-1005	1.000	1.000	0.078	0.078	0.117	0.117	90°
-1501	0.875	1.625	0.094	0.250	0.117	0.117	90°
ALCOA							
28172	0.812	0.875	0.063	0.250	0.125	0.094	90°
83264	0.750	0.875	0.050	0.250	0.062	0.062	90°

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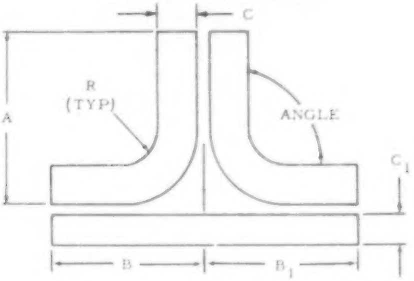
Figure 2-128. Extruded Parts Replacement (Sheet 4 of 11)

STANDARD T-SECTIONS



ORIGINAL DIE NO.		EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)						
		A	B	B_1	C	C_1	R	ANGLE
AND10136	-1303	1.000	0.688	0.688	0.078	0.078	0.125	90°
	-1401	0.718	0.750	0.750	0.032	0.032	0.125	90°
	-1406	1.200	0.750	0.750	0.050	0.050	0.125	90°
	-1501	1.625	0.8125	0.8125	0.039	0.039	0.125	90°
	-1601	0.825	0.875	0.875	0.050	0.050	0.125	90°
	-1603	1.125	0.875	0.875	0.094	0.094	0.125	90°
	-1605	1.281	0.875	0.875	0.094	0.094	0.125	90°
	-2001	0.960	1.000	1.000	0.040	0.040	0.125	90°
	-2002	0.950	1.000	1.000	0.050	0.050	0.125	90°
	-2004	1.210	1.000	1.000	0.040	0.040	0.125	90°
	-2006	1.187	1.000	1.000	0.063	0.063	0.125	90°
	-2405	1.562	1.250	1.250	0.063	0.063	0.125	90°
	-2406	1.545	1.250	1.250	0.080	0.080	0.125	90°
	-2407	2.000	1.250	1.250	0.125	0.125	0.125	90°
	-3001	1.500	1.500	1.500	0.125	0.125	0.125	90°
	-3005	2.437	1.500	1.500	0.063	0.063	0.125	90°
ALCOA	12756	1.170	1.250	1.250	0.080	0.080	0.125	90°
	13892	1.180	1.000	1.000	0.045	0.090	0.125	90°
	22008	0.968	1.250	1.250	0.032	0.032	0.125	90°
	22981	0.787	0.875	0.875	0.025	0.025	0.094	90°
	23160	1.468	0.750	0.750	0.032	0.032	0.125	90°
	27622	1.925	1.375	1.375	0.050	0.200	0.125	90°
	27698	0.720	0.9375	0.9375	0.030	0.030	0.094	90°
	29075	1.130	0.950	0.950	0.050	0.130	0.060	90°
	30670	0.727	0.750	0.750	0.040	0.085	0.125	90°
	30674	0.7245	1.000	1.000	0.0255	0.0255	0.093	90°
	31543	1.9065	1.0125	1.0125	0.0625	0.0935	0.062	90°
	31901	1.1535	0.6875	0.6875	0.0465	0.0465	0.062	90°
	32220	0.105	1.000	1.000	0.025	0.025	0.090	90°
	33185	1.3125	1.750	1.750	0.0625	0.0625	0.125	90°
	33495	2.468	1.250	1.250	0.032	0.032	0.130	90°
	37289	2.687	1.437	1.437	0.063	0.063	0.125	90°
	43774	1.563	1.500	1.500	0.047	0.047	0.062	90°
	44132	1.406	1.500	1.500	0.094	0.094	0.188	90°
	49225	0.843	1.000	1.000	0.032	0.032	0.125	90°
	51670	3.730	1.625	1.625	0.080	0.270	0.200	90°
	51994	2.844	1.500	1.500	0.094	0.156	0.125	90°
	52985	2.850	2.100	1.800	0.125	0.156	0.130	90°
	52233	1.500	1.000	1.000	0.625	0.125	0.125	90°
	52361	1.920	2.000	2.000	0.080	0.080	0.156	90°
	52515	1.600	2.900	2.900	0.080	0.120	0.160	90°
	52966	3.250	0.750	0.750	0.040	0.040	0.120	90°
	52057	0.993	0.875	0.875	0.062	0.062	0.094	85°30'
	52986	2.7875	2.350	2.350	0.0625	0.0625	0.130	90°
	55794	1.960	1.000	1.000	0.040	0.040	0.125	90°
	59331	3.875	1.075	1.075	0.075	0.125	0.130	90°
	59337	2.869	1.250	1.250	0.125	0.131	0.150	90°
	62409	1.078	2.125	2.125	0.047	0.047	0.094	90°
	66017	1.450	2.000	2.000	0.050	0.050	0.125	90°
	66211	3.7505	1.190	1.190	0.0625	0.2495	0.188	90°
	66517	0.832	2.000	2.000	0.032	0.032	0.125	90°

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Figure 2-128. Extruded Parts Replacement (Sheet 5 of 11)

STANDARD T-SECTIONS (CONT)

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)						
	A	B	B_1	C	C_1	R	ANGLE
ALCOA 69464	1.410	1.504	1.196	0.045	0.080	0.125	103°
76062	3.165	0.127	0.127	0.105	0.305	0.250	90°
76959	1.875	1.000	1.000	0.125	0.125	0.094	90°
HARVEY ALUMINUM 15152	0.968	0.875	0.875	0.032	0.032	0.064	90°
REYNOLDS ALUMINUM 6447	3.200	1.080	1.080	0.080	0.300	0.120	90°
8665	1.340	1.120	1.120	0.081	0.081	0.125	90°
9097	2.285	1.000	1.000	0.063	0.215	0.090	90°
11416	0.968	1.000	1.000	0.032	0.032	0.064	90°
11730	2.075	1.000	1.000	0.050	0.075	0.130	90°
16908	2.175	1.250	1.250	0.050	0.025	0.125	90°
18637	3.730	1.625	1.625	0.080	0.270	0.200	90°
22769	2.110	1.512	1.888	0.050	0.200	0.160	90°
VERTOL STANDARD 90302	1.160	1.190	1.190	0.125	--	0.125	90°
90303	1.820	0.900	0.900	0.125	--	0.125	90°
90304	1.160	1.655	1.655	0.125	--	0.125	90°
90305	1.076	0.030	1.310	0.050	0.044	0.094	104°
90306	1.725	1.250	1.250	0.125	0.055	0.125	90°
90307	1.687	1.000	1.000	0.063	0.063	0.125	98°
90308	1.500	1.200	1.200	0.200	--	0.120	90°
90309	1.600	1.000	1.000	0.200	--	0.120	90°
90310	1.625	1.500	1.500	0.200	--	0.120	90°
90311	1.937	1.000	1.000	0.063	0.063	0.125	101°
90313	1.292	1.250	1.250	0.080	0.028	0.125	90°
90314	1.970	2.190	4.590	0.090	0.030	0.125	104°
90316	1.445	1.655	1.655	0.125	0.055	0.125	90°
BAC1501-100515	2.130	1.110	1.110	0.250	0.078	0.156	90°

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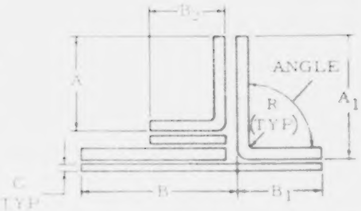
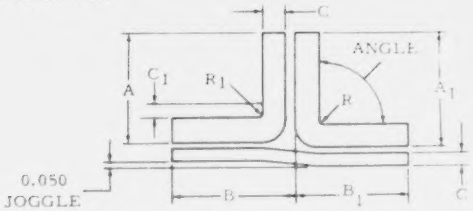
Figure 2-128. Extruded Parts Replacement (Sheet 6 of 11)

SPECIAL T-SECTIONS

VS 90315


B2
A
ANGLE
R
(TYP)
A1
C
TYP
B
B1

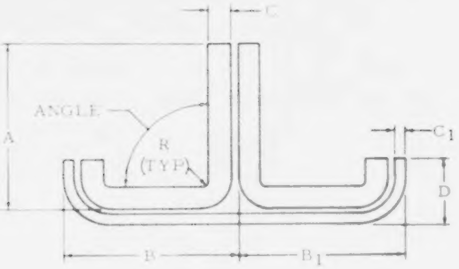

C
ANGLE
A
C1
R1
R
A1
0.050
JOGGLE
B
B1
C

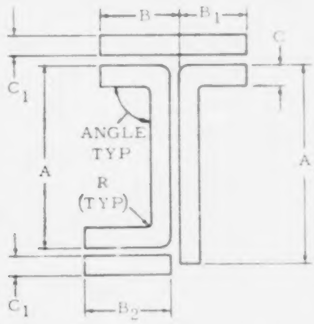
VS 90321

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)								
	A	A_1	B	B_1	B_2	C	R		ANGLE
VERTOL STANDARD 90315	0.874	0.908	1.558	0.912	0.812	0.032	0.090		90°

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)								
	A	A_1	B	B_1	C	C_1	R	R_1	ANGLE
VERTOL STANDARD 90321	0.930	0.980	0.750	0.750	0.020	0.010	0.06	0.09	90°

VS 90312


C
ANGLE
A
R
(TYP)
C1
D
B
B1


B
B1
C
C1
ANGLE
TYP
A
R
(TYP)
A1
C1
B2

VS 90537

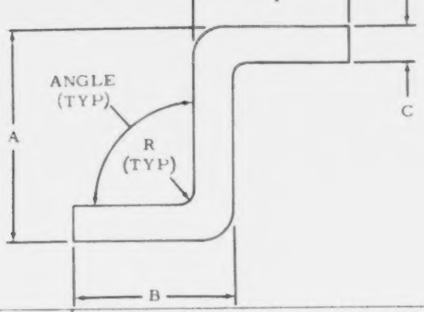
ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)								
	A	B	B_1	C	C_1	D	R		ANGLE
VERTOL STANDARD 90312	2.100	1.500	1.500	0.050	0.025	0.250	0.187		90°, 45°

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)								
	A	A_1	B	B_1	B_2	C	C_1	R		ANGLE
VERTOL STANDARD 90537	6.07	6.210	1.250	1.250	1.900	0.100	1.40	0.12		90°

B114-49-355

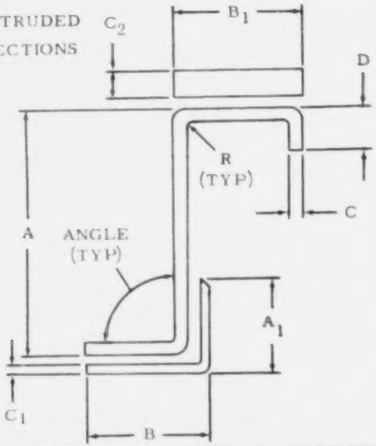
Figure 2-128. Extruded Parts Replacement (Sheet 7 of 11)

STANDARD Z-SECTIONS

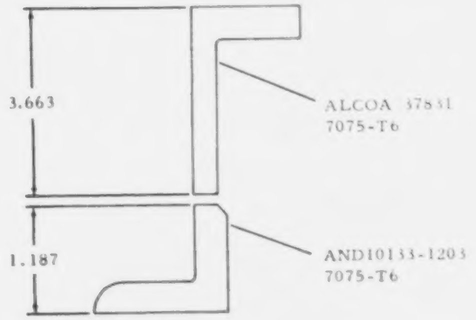

B1
C
ANGLE (TYP)
R (TYP)
A
B

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, MIL-S-18729, COND N)					
	A	B	B_1	C	R	ANGLE
AND10138-0403	0.500	0.750	0.750	0.050	0.094	90°
-1004	1.000	0.750	0.750	0.062	0.125	90°
-1005	1.000	0.750	0.750	0.078	0.125	90°
-1009	1.000	1.000	1.000	0.063	0.125	90°
AND10139-0505	0.625	1.000	0.750	0.063	0.125	90°
-0707	0.875	1.000	0.750	0.062	0.125	90°
-1106	1.125	1.125	0.625	0.063	0.125	90°
ALCOA 59675	1.120	0.700	0.600	0.040	0.125	90°
85491	1.500	1.060	1.060	0.125	0.120	90°
VERTOL STANDARD BAC1517-1459	0.820	1.000	0.810	0.060	0.120	90°

SPECIAL EXTRUDED Z-SECTIONS


C2
B1
D
R (TYP)
C
A
ANGLE (TYP)
A1
C1
B

ALTERNATE METHOD USING EXTRUDED ANGLES


3.663
ALCOA 37831
7075-T6
1.187
AND10133-1203
7075-T6

ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, MIL-S-18729, COND N)									
	A	A_1	B	B_1	C	C_1	C2	D	R	ANGLE
VERTOL STANDARD 90538	4.655	1.187	1.005	1.060	0.090	0.035	0.160	0.720	0.120	90°

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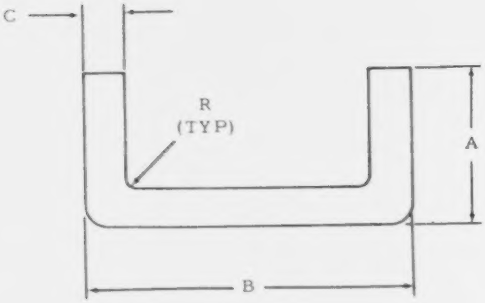
Figure 2-128. Extruded Parts Replacement (Sheet 8 of 11)

STANDARD CHANNELS



ORIGINAL DIE NO.	EQUIVALENT FORMED SECTION DIMENSIONS (MAKE ALL REPLACEMENTS FROM 4130, SPEC MIL-S-18729, COND N)			
	A	B	C	R
AND10137-0707	0.750	0.875	0.062	0.125
-1005	0.750	1.000	0.063	0.125
-1405	1.125	1.500	0.094	0.125
-1406	1.125	1.500	0.156	0.125
-1612	2.000	1.750	0.188	0.188
-2009	1.500	2.000	0.125	0.125
-2404	1.375	2.500	0.125	0.125
-2405	1.375	2.500	0.156	0.125
-2601	1.000	2.750	0.125	0.125
NAS345-126	1.000	3.000	0.156	0.125
-134	1.375	3.500	0.156	0.156
ALCOA				
2129	1.000	0.500	0.125	SHARP
56914	1.000	0.508	0.051	0.062
59256	0.750	1.500	0.051	0.062
VERTOL STANDARDS				
90408	1.750	5.125	0.188	0.250

42x39

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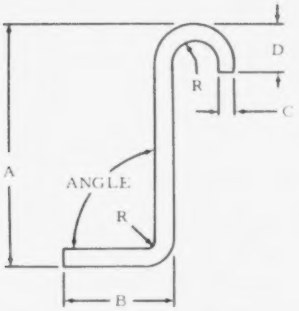
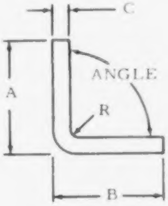
Figure 2-128. Extruded Parts Replacement (Sheet 9 of 11)

STANDARD FORMED SHAPES



DIE NO. ORIGINAL	REPLACEMENT DIMENSIONS (MAKE FROM SAME MATERIAL AS ORIGINAL)					
	A	B	C	D	R	ANGLE
VERTOL						
STANDARD 70503-1	1.000	0.750	0.025	0.160	0.120	90°
70503-2	1.000	0.750	0.032	0.160	0.120	90°
70503-3	1.000	0.750	0.040	0.160	0.120	90°
BAC1517-1522	1.000	0.750	0.032	0.160	0.120	90°
BAC1517-1523	1.000	0.750	0.040	0.160	0.120	90°



DIE NO. ORIGINAL	REPLACEMENT DIMENSIONS (MAKE FROM SAME MATERIAL AS ORIGINAL)				
	A	B	C	R	ANGLE
VERTOL STANDARD					
70504-1	0.500	0.700	0.025	0.160	90°
70504-2	0.700	0.700	0.025	0.160	90°
70504-3	0.500	0.700	0.032	0.190	90°
70504-4	0.700	0.700	0.032	0.190	90°

B114-52-3550

Figure 2-128. Extruded Parts Replacement (Sheet 10 of 11)

MISCELLANEOUS EXTRUSIONS AND STANDARD FORMED SHAPES

ORIGINAL DIE NO.		EQUIVALENT FORMED SECTION DIMENSIONS
ALCOA	T-364	DUE TO THEIR COMPLEXITY OF SHAPE, CROSS-SECTION AREA, AND VARYING THICKNESS, FORMED REPLACEMENTS ARE NOT GENERALLY PRACTICAL. IN MOST INSTANCES WHERE A REPLACEMENT IS REQUIRED, IT WILL BE MORE PRACTICAL TO REPLACE THE ENTIRE DAMAGED EXTRUSION OR THE DAMAGED PORTION WITH A CORRESPONDING LENGTH OF THE ORIGINAL.
	60414	
REYNOLDS ALUMINUM	10270	
HARVEY ALUMINUM	13726-3	
VERTOL STANDARD	90111	
	90317	
	90318	
	90319	
	90320	
	90328	
	90332	
	90406	
	90407	
	90413	
	90415	
	90513	
	90515	
	90517	
	90523	
	90525	
	90526	
	90529	
	90530	
	90531	
	90532	
	90542	
	90543	
	90544	
	90545	
	90557	
	90558	
	90575	
	90576	
	90577	
	90578	
	90579	
	90585	
	90601	
	90602	
	90604	
BAC1506		
	-1985	
1520		
	-1320	

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Figure 2-128. Extruded Parts Replacement (Sheet 11 of 11)

h. Deleted.

i. Apply tape to cleaned surfaces by starting tape at one end and pressing it down firmly. Smooth tape down with a wooden scraper and work tape from center to edge with sufficient pressure to eliminate air pockets and wrinkles and to ensure good adhesion.

NOTE

All edges must be firmly bonded to surface. Small blisters and voids must be kept to a minimum. Voids around rivet and screw heads are permissible.

2-587. Removal of Antichafing Tape.

Rejected or improperly applied tape should be removed as follows:

WARNING

Methyl-ethyl-ketone is toxic. Work in a well-ventilated area. Avoid inhaling fumes and prolonged contact with the skin. Wash thoroughly after using. Wear protective clothing.

a. Saturate tape with methyl-ethyl-ketone (C216). Allow a few minutes for tape to soak. Then, carefully peel tape from surface.

b. Apply new tape. Refer to para 2-586.

2-588. Application of Velcro Tape.

This procedure is used for the application of precoated adhesive-backed or uncoated Velcro hook-and-pile tape. This fastener is used for attachment and repair of sound-proofing blankets and coverings.

a. Clean surface to which tape is to be applied. Use cloths (C104) soaked with solvent (C137). Wipe surfaces with dry cloths before solvent evaporates.

b. Apply masking tape (C337) around the surface to be covered.

NOTE

For best results surface should be bare of prime-coat.

c. Brush a coat of adhesive (C52) on masked surface and tape (C341.1).

NOTE

The shelf life of adhesive and tape is 6 months when stored at 60° to 80°F (16° to 27°C).

d. Press tape in place within 5 minutes of adhesive application, but not sooner than 1 minute.

e. If tape is too long, insert a piece of wood between tape and coated surface. Trim tape with a sharp knife.

NOTE

Tape must be applied to fabrics by stitching with nylon thread (C361) in accordance with FED. STD 751.

f. Check for acceptable bonding by gently pulling edges of tape with fingernail.

NOTE

Small voids around rivet and screw heads are permissible.

2-589. Fillers.

The following paragraphs contain information on the filler material used on the honeycomb structures and faired surfaces.

2-590. Application of Corfil 615.

This procedure is used when adding Corfil 615 as an edge filler or core filler on aluminum alloy sandwich honeycomb structures.

WARNING

The vapors of this mixture are toxic. Coating and bonding procedures should be performed in a well-ventilated room. Avoid contact with the skin. If accidental contact with the skin is made, wash exposed area immediately with soap (C312) and water.

a. Place 7 parts, by weight, of curing agent DTA (C129) and 100 parts, by weight, of filler (C146) into a clean container, and mix them thoroughly.

NOTE

In the mixed form the working life of the material is 30 minutes to 2 hours. The longer working life can be attained by handling the material in a flat shallow tray rather than a deep cylindrical container.

b. Remove all loose filler or debris. Clean area to be filled with naphtha (C218) applied by brushing.

c. Allow naphtha to completely evaporate.

d. Apply masking tape (C337) to all adjacent areas.

e. Pour filler material into area to be filled. The height should be slightly above original core or edge.

f. Allow material to harden for 6 hours at 70°F (21°C) or use heat lamps and cure the material at 110° to 130°F (43° to 54°C) for 1 hour.

g. Work hardened materials to desired height and contour, using abrasive paper (C3 or C4).

h. Remove all sanding dust and chips from area by air blasting.

i. Refinish reworked area. Refer to para 2-606 or 2-617.

2-591. Application of Palmer 611 Compound (AVIM).

This procedure is used for the application of Palmer 611 compound as an edge or insert filling or fairing.

a. Place 95 parts, by weight, of compound (C275) to 5 parts, by weight, of accelerator (C8) into a clean container.

b. Stir components until thoroughly mixed.

NOTE

When a low viscosity is required, the compound may be thinned with resin. In this case, an amount of accelerator necessary to catalyze resin must be added in same ratio given in step a. Working life of compound is 2½ to 3½ hours at 75°F (24°C).

c. Clean parts using a cloth (C104) soaked with solvent or naphtha (C137 or C218).

d. Roughen cleaned surface lightly to ensure adhesion, using abrasive paper (C3 or C4).

e. Repeat step c. to remove sanding dust.

f. Apply compound and work it into surface with a spatula.

g. Remove excess compound around surface with a spatula.

h. Cure compound and filled or faired surface with heat lamps, in accordance with one of the following cycles:

(1) 16 hours at 120°F (49°C).

(2) 1 hour at 150°F (66°C); then 16 hours at 70°F (21°C).

(3) 1 hour at 200°F (93°C).

(4) 1½ hours at 300°F (149°C).

2-592. Removal of Finishes.

Subsequent paragraphs contain information on preparation of solution and procedure for removal of finishes from magnesium, magnesium alloy, or steel parts.

2-593. *Preparation of Ruststripper Solution (AVIM).*

WARNING

> Rustripper is an alkaline solution and should not be allowed to contact body skin. If accidental contact is made, flush skin with water immediately. Wear gloves during all procedures.

a. Add 16 ounces of Ruststripper (C322) to 1 gallon of water in a steel tank.

b. Stir solution thoroughly.

c. Heat solution to 190° to 210°F (88° to 99°C).

2-594. *Finish Removal (AVIM).*

a. Immerse part in solution approximately 15 minutes.

b. Remove part from solution and rinse it with running water.

c. Wipe part dry with cloths (C104).

d. If any finish remains on part, immerse it in a solution (C131). Scrub it with a brush to loosen finish.

e. Remove part from solution. Rinse it with running water and wipe it dry with cloths (C104).

NOTE

> On cadmium-plated steel parts, discoloration may appear when immersion time in Rustripper solution exceeds 15 minutes. However, discoloration is superficial and not harmful to part.

2-595. *Corrosion Treatment and Prevention.*

a. During any inspection of the aircraft or components, the person making the inspection should pay particular attention to areas prone to corrosion. When corrosion is found, a prime consideration is to evaluate what corrective action will be required to correct the discrepancy. Corrosion repair and treatment can be time consuming, and for this reason, early evaluation is essential for good aircraft maintenance planning. This evaluation will assist in determining if sheet metal or aircraft mechanics will be necessary to make the needed repair. In cases where corrosion has exceeded the accept or reject criteria, material replacement will be necessary. For material replacement, refer to TM 55-1500-204-25/1, General Aircraft Maintenance Manual. For corrosion treatment, refer to TM 43-0105, Corrosion Control for Army Aircraft; and for painting, refer to TM 55-1500-345-23, Painting and Marking of Army Aircraft. If corrosion is found and not covered by applicable TM's, submit a DA Form 2028, Recommended Changes to Equipment Technical Publications, or an Equipment Improvement Recommendation (EIR) where a design change is necessary.

b. Paragraphs 2-596 thru 2-600 contain general information on forms and causes of corrosion, detection of corrosion, and cleaning and treating corroded parts.

2-596. *Superficial Corrosion.*

This is the least serious of the various forms of corrosion. After the deposits are removed, an etching will be noticed which results in the clad surface having a series of hills and valleys. Provided that the etching has not reached the core, the effect on the strength of ductility of the metal is negligible. Corrosion of a similar degree on non-clad alloy parts is serious.

2-597. *Electrolytic Corrosion.*

There are two major causes of this form of corrosion: dissimilar metals contact and condensation. When dissimilar metals are in contact in the presence of moisture, an electric current flows between the metals producing chemical byproducts that results in the corrosion of one of the metals. Corrosion by condensation is caused by exhaust gases, battery acids, or other corrosive materials contacting the metal.

2-598. *Intergranular Corrosion.*

This form of corrosion is not easily detected. It results from imperfect heat treatment and occurs principally in unclad structuraly-type alloy parts. The corrosion progresses between the grain boundaries of the part. In the case of sheet stock, corrosion may even penetrate thru the section. It is the most dangerous form of corrosion that can occur to sheet stock because strength can be lowered considerably before any corrosion products become visible.

2-599. *Stress Corrosion.*

This form of corrosion occcurs when a particular part is subjected to both high stress and corrosive conditions. Stress corrosion will occur along the lines of stress and in machined areas if the part has been overstressed and not fully relieved through proper heat treatment.

2-600. *Hygroscopic Material Corrosion.*

This form of corrosion is caused by wood, cork, sponge rubber, felt, asbestos, etc., absorbing and holding water in contact with the part.

2-601. *Detection of Corrosion.*

Corrosion will not normally be as noticeable on organically-coated, clad, or plated surfaces as on uncoated or unprotected surfaces. However, corrosion can attack the part, even though coated, because moisture can penetrate enamels, lacquers, and primers.

a. Affected areas are generally scaly or blistered in appearance or sometimes the coating is discolored.

b. Corrosion on clad and plated surfaces can often be recognized by dulling and pitting of the area. It sometimes is accompanied by whitish or reddish powdery deposits.

CAUTION

Be careful to avoid further damage when using a sharp instrument. In some cases, preliminary cleaning of the corroded or suspected area may be necessary. Removal of the scales of finishes and powdery deposits may be required before examination.

c. The extent of corrosion may be determined by tests and visual inspection. A sharp instrument may be used for making this examination.

d. Determine if the cladding is effective and that there has been no loss in corrosion resistance.

2-602. *Cleaning and Treating Salt-Corroded Parts.*

Paragraphs 2-603 and 2-604 contain limited anti-corrosion protective measures in event of salt water immersion. These measures should be taken as soon as possible and only if the proper materials and equipment are not available. Refer to table 2-24 for normal cleaning and treating of corroded parts.

2-603. *Limited Measures for the Helicopter.*

As soon as practical after removal of helicopter from salt-water, the following steps should be accomplished to prevent corrosion:

a. Wash helicopter with fresh water and let it dry.

b. Prepare a mixture of 75 percent lubricating oil (C224) and 25 percent corrosion-preventive compound, type I, aircraft engine (C123).

c. Coat bare metal and moving parts by spraying or rubbing them with the mixture.

d. Coat all nonmechanical exterior surfaces, which required maximum corrosion protection, with corrosion-preventive compound, type I, exterior surface (C124).

CAUTION

Do not allow hydraulic fluid to contact parts that attain high temperatures. Such contact creates fire hazard. Avoid contacting ignition wires, seals, or other rubber parts with hydraulic fluid. Such contact may have a deteriorating effect on them.

e. Wipe exposed portions of landing gear shock strut pistons with hydraulic fluid (C175).

f. Inspect parts of landing gear for unfinished areas. Retouch them immediately with applicable primer and lacquer.

Table 2-24. Cleaning and Treating Corroded Parts

METAL	FORM	CLEANING	TREATMENT
Aluminum unfinished surfaces only	Mild surface pitting, staining, and superficial etching	Apply cleaning compound (C101) and heavy duty brightener	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum	Heavy surface pitting	Hand rub with aluminum wool (C57) and kerosene (C185). Apply cleaning compound (C101) and rinse with fresh water	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum Alclad unfinished surfaces	Mild or heavy surface pitting, staining, and superficial etching	Apply cleaning compound (C101) and rinse with fresh water. Do not use abrasives	Apply applicable lacquer as required. On internal surfaces use one coat of primer (C259). Unfinished external surfaces should be finished with lacquer (C187)
Aluminum	Intergranular corrosion	Remove corroded areas with routing tools. Burnish parts to remove all sharp edges	Treat immediately with a 5% solution of potassium dichromate (C254) and allow to dry. Brush off excess crystals. Spray a uniform coat of primer (C259) on the area. Spray two coats of primer if there are no provisions for drainage
Aluminum	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Magnesium	Surface pitting	Large, nonremovable parts — remove corrosion products with a stiff bristle brush	Apply a type I chrome-pickle solution in accordance with MIL-M-3171 for 1 minute and wash with fresh water
Magnesium	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Steel	Severly rusted	Replace parts	Not applicable
Steel	Lightly rusted parts (No deep pitting)	Use steel wool (C327) to remove rust and clean as necessary	Apply one coat of primer (C259) on previously cadmium-plated parts. Apply two coats of aluminum pigmented lacquer or finish to match. Cadmium-plate removable parts in accordance with QQ-P-416

2-604. Limited Measures for Specific Parts.

a. Refer to table 2-24 for information on removal of products of corrosion.

b. Dry the surface and apply two coats of zinc chromate primer (C259). Allow each coat to dry.

c. Refinish primed area, using same type and color material as original.

d. If original material is not available, apply a liberal coat of corrosion-preventive compound, type I, exterior surface (C124) over refinished area. Or, apply a liberal coat of grease over bare washed area.

2-605. Material Substitution.

CAUTION

> Substitution of materials can create a corrosion hazard. If the substitute material is different than original part (as when a 7075-T6 aluminum extrusion is reinforced with a 4130 steel strap), failure to insulate metals from direct contact with each other will permit electrolytic corrosion to attack repaired area. Insulation of dissimilar metals, described in para 2-619 is extremely important.

When material for a non-load-bearing part, such as a filler, is not available in thickness required, build up to desired thickness with two or more pieces. Substitutions of this type are not permitted for loadbearing parts, such as reinforcements and insertions.

2-606. Finishes.

Paragraphs 2-607 thru 2-627 contain general information on restoring transparent plastic finish, inorganic surface treatment of metal parts, organic finishing of metal parts, organic finishing of nonmetallic parts, and special finishes.

2-607. Transparent Plastic Finish Restoration.

Restore transparent plastics, using glass polish kit RS-69, FSN 1560-450-3622 (C250) as described in paragraphs 2-618 and 2-619.

NOTE

> The glass polish kit RS-69 contains the following materials:
>
> 3- by 6-inch sheets of abrasive papers: 2400A, 3200A, 3600A, 4000A, 6000A and 8000A.
>
> Two sheets each of No. 400 and 600 sandpaper,
> One 2-ounce container of talcum powder
> One 1-ounce container of liquid detergent
> One 1-ounce container of anti-static cream
> Five industrial wipers
> One 3- by 4-inch foam block
> Two 3- by 4-inch cardboard blocks
> One instruction sheet.

2-608. General Information.

a. Cleanliness. Make sure that abrasives do not become contaminated with foreign matter. Keep abrasives away from dirt, dust, or other gritty material which could scratch the distorted area. Wipe plastic clean of abraded particles during and after each abrading operation.

b. Preservation. The abrasives may be used many times by washing with liquid detergent and water, drying, and sprinkling with talcum powder. Talcum powder sprinkled on the abrasive, during use, will add to the life of the abrasive.

c. Heat. Attempts to restore a warm surface is not recommended. Work slowly to avoid building up heat. Excessive heat will cause slight surface distortion. Abrasives may be used wet or dry. In hot humid areas, it may be necessary to reduce surface temperature by using the abrasives with either water or a detergent water mixture. A fan may be used to cool the working surface.

d. Application. For most effective results, hand application of abrasives is recommended. However, an orbital vibrator with speeds in the 12,000 rpm range, using an abrasive pad about 4¼ inches square, may be used.

e. Area. When changing from a coarse to a fine abrasive, abrade an area considerably larger than the preceding area, in order to accomplish a smooth blend.

2-609. Preparation and Restoring Procedure.

a. Fill gallon container with cold water and mix in 1 pint of liquid detergent.

b. Fill quart container with mixture.

c. Clean area to be restored with mixture and cloths.

d. Rinse quart container with cold water and refill with mixture.

e. Wrap No. 400 abrasive paper around foam block. Insert cardboard block between abrasive paper and foam block to act as a cushion and a moisture retainer.

f. Abrade the area using the mixture in the quart container and the 400 abrasive paper.

g. Rinse abraded area with mixture from gallon container.

h. Rinse quart container with cold water.

i. Repeat steps e. through h. using No. 600 abrasive paper and abrade for 3 minutes per square foot.

j. Wrap No. 2400A abrasive paper around foam block without cardboard. Abrade for approximately 2 minutes per square foot of material. Use alternate horizontal and vertical strokes in 20-second intervals.

k. Repeat step j. using each of the succeedingly finer grade abrasive paper (No. 3200A, 3600A, 4000A, 6000A, and 8000A). Use slight pressure and a shorter time span for the No. 8000 abrasive paper.

l. Apply a thin coat of antistatic cream using the fingertips with a circular motion. Buff the area until dry with a wipe cloth.

m. Visually inspect the restored area for distortion. Observation of a distant object (about 30 feet) such as the crossed bars of a window, pole or a tree should show no distortion. If any distortion is visible, repeat steps as required until it is removed.

2-610. Inorganic Surface Treatment of Metal Parts.

Paragraphs 2-611 thru 2-616 contain general information on inorganic surface treatment of aluminum alloys, magnesium alloys, carbon and low alloy steels, brass, bronze, copper, and nickel alloys, corrosion and heat-resistant steels, and titanium and titanium alloys.

2-611. Aluminum Alloys. The surfaces of aluminum alloy repair or replacement parts should be treated prior to assembly. All cutting, forming, and drilling must be accomplished prior to treatment.

a. All parts, except interior parts made of, or clad with, 1100, 3003, 5052, 6053, 6061, or 7072 aluminum alloy, should be given one of the following chemical treatments:

(1) Alodizing MIL-5541.

(2) Sulfuric acid anodizing MI1-A-8625, type II.

(3) Chromic acid anodizing MIL-A-8625, type II.

b. Interior parts made of, or clad with, 1100, 3003, 5052, 6053, 6061, or 7072 aluminum alloy, which will receive an organic finish may be chromidized in accordance with MIL-S-5002.

c. If immersion equipment is not available or if only touchup is required, parts can be treated with a brush coating (C127). A brush phosphate coating, type II (C214), can also be used.

2-612. Magnesium Alloy. These alloys, in contact with moisture, corrode faster than any other metal on the helicopter. All repair of replacement parts must be treated prior to assembly. All cutting, forming, and drilling must be accomplished prior to treatement. Refer to table 2-24 for cleaning and treating magnesium alloy parts.

2-613. Carbon and Low-Alloy Steels. The surfaces of unplated carbon and low-alloy steel repair or replacement parts should receive a prepaint phosphate treatment TT-C-490, type I. If immersion equipment is not available, parts can be treated with a brush phosphate coating type II (C214). All cutting, forming, and drilling must be accomplished prior to treatment.

2-614. Brass, Bronze, Copper, and Nickel Alloys. Parts made of these metals require no surface treatment.

2-615. Corrosion- and Heat-Resistant Steels. These metals normally do not require surface treatment. However, when specific types of work are performed on them, treatments in subsequent steps should be used.

a. Parts that are fusion welded or scaled from heat treatment should be descaled by pickling in accordance with MIL-S-5002.

b. Parts that are machined, formed on nonferrous dies, barrel-deburred, cleaned by vapor- or grit-blasting, or polished, should be hot- or cold-solution passivated in accordance with MIL-S-5002.

2-616. Titanium and Titanium Alloys. Parts made of these metals require no surface treatment.

2-617. Organic Finishing of Metal Parts.

Paragraphs 2-618 thru 2-621 provide information on the application of primers and finishes to interior and exterior metals parts.

2-618. Interior Structures Detail or Repair Parts — Nonfaying Surfaces and Similar Metal Contact. Prior to the installation of interior repair or replacement parts which will not be contacting surfaces of dissimilar metal, a primer finish, as described in subsequent steps should be applied.

a. Apply one coat of epoxy primer (C259.1) to aluminum alloy parts and two additional coats in the following areas.

(1) Entire cockpit fuselage section under cockpit floor, from forward canted bulkhead to sta 160 including bottom of floor.

(2) Entire cabin fuselage section under floor, from sta 160 to 440 excluding bottom of floor.

(3) Entire aft fuselage section under floor, from sta 440 to 482 excluding bottom of floor, and all internal areas from wl 0 downward, between sta 502.4 and 554, except where a final finish is required.

(4) Entire cargo loading ramp under floor, except bottom of floor.

(5) Entire pod installation, from wl 0 downward, including wheel wells, except areas to be finished same as external areas.

b. Apply three coats of epoxy primer (C259.1) to magnesium alloy parts, except as noted in step c. unless a final finish coating is to be applied. In this case, only two coats are required. Apply one coat of wash primer (C266) to magnesium alloy forgings prior to application of zinc chromate primer.

c. Apply one coat of wash primer (C266) and a heavy coat of vinyl primer (C258) to extruded ZK60 magensium alloy parts.

d. Apply one coat of wash primer (C266) and one coat of epoxy primer (C259.1) to cadmium-plated and unplated carbon and low-alloy parts.

2-619. Interior Structures Detail and Repair Parts — Faying Surfaces Dissimilar Metal Contact. Prior to assembly of repair or replacement parts, make sure that all existing corrosion has been removed in area and that parts are properly insulated, one from the other.

a. Where corrosion exists, remove the corrosive products and finishes at external lap joints as noted in table 2-24.

b. Where a magnesium alloy is involved, apply a minimum of two coats of epoxy primer (C259.1) on each faying surface. In addition, insert vinyl tape (C334) between faying surfaces. Vinyl tape must extend beyond the edge of faying surfaces at least ¼ inch. If trimmed close, the tape will not insulate properly. Where use of tape is impractical, assemble parts wet with zinc chromate primer and provide an adequate primer fillet at join boundaries.

c. Where a steel alloy is involved, apply two coats of zinc chromate primer to each surface.

d. Apply an additional coat of epoxy primer (C259.1) on exterior edges of faying surfaces where magnesium or steel alloy parts are assembled.

e. Install all rivets, bolts, nuts, and washers wet with epoxy primer (C259.1).

f. Apply an additional coat of epoxy primer (C259.1) to heads of aluminum alloy rivets driven through corrosion-resistant steel.

2-620. Final Finish—Interior Metal Structures. After priming, repair or replacement parts should have a final finish applied to match adjacent structures. The final finish may be applied before or after assembly of the detail part.

a. Finish all parts of cockpit fuselage section which will reflect in windshields, including switch panels, with one coat of lusterless black lacquer (C191).

b. Finish all other parts which will be exposed after assembly, such as floors, walls, seats, console, pedestal, foot pedals, and instrument panels as shown in fig. 2-129.

c. Apply internal markings. (See fig. 2-129.)

2-621. Final Finish—Exterior Metal Structures. All exterior finishes and markings shall be applied as directed in TB746-93-2.

2-622. Organic Finishing of Nonmetallic Parts.

Subsequent information is provided for the refinishing of all impregnated glass cloth parts, except the rotary-wing blades, which are to be refinished as directed in para 5-103.

a. Using cloths (C104) soaked with naphtha (C218), wash part three times.

b. Rub part lightly with abrasive paper (C3 or C4).

c. Repeat step a.

d. Apply one coat of zinc chromate primer.

e. Apply two coats of lacquer. The color must match adjacent structure.

f. If the part is on exterior surfaces forward of sta 120 or aft of sta 508, apply the paint system (C233) in accordance with MIL-P-21698 or as directed in TB746-93-2, as applicable.

2-623. Special Finishes.

Surface treatment of areas exposed to acid or alkaline contact, decal overcoating or used for walkways is presented in para 2-624 thru 2-626.

2-624. Protective Coatings.

a. Acid protection. Surfaces within 24 inches of relief tubes should be given one coat of epoxy primer (C259.1) and a finish coat of acid-resistant lacquer (C186). The color of the lacquer (black or white) should afford maximum contrast with adjacent areas.

b. Alkaline protection. Surfaces within 12 inches of NiCad storage batteries should be given one coat of vinyl primer (C258) and two coats of exterior gray enamel (C140.1).

2-625. Decal Overcoating. Overcoat decals used aft of sta 440, interior and exterior as follows to prevent deterioration.

a. Remove all oil or other contamination from decal. Clean area approximately 6-inches wide, around decal, using cloths (C104) soaked with naphtha (C218) or equivalent.

b. If decal cannot be cleaned satisfactorily, replace it or use stenciled lacquer markings. Stenciled lacquer markings must be used when rework is required for *STEP* legends.

CAUTION

Do not apply lacquer wet or heavy. Edge lifting of the decal can result.

c. Apply an 0.001-inch-dry film thickness of lacquer (C189) to decal by spraying. A minimum of four passes should achieve this thickness.

2-626. Walkways. Subsequent steps contain information on the application of type I (smooth) and type II (rough) walkway materials (C375, C376, C377 and C378). Where reference is made throughout the manual to these steps, the type material, color, and the number of coats, as specified in the referencing paragraphs should be used.

a. Remove all wax, grease, oil, dirt, and other foreign material from areas to be coated.

b. Clean metal surfaces with a cloth (C104), soaked in solvent (C137).

c. Mask adjacent areas using masking tape (C337) and kraft paper (C234).

d. Spray two coats of epoxy primer (C259.1). Allow each coat to dry.

e. Prepare desired type and color of walkway material in accordance with manufacturer's directions on container.

NOTE

Walkway materials should be applied unthinned. However, the material may be thinned with either toluene (C363) or xylene (C389) for brushing or spraying purposes.

f. Apply an initial, thin, uniform coat of walkway material to primed surfaces. Allow it to dry thoroughly.

NOTE

Type I (smooth) walkway material (C375 and C376), may be applied with a brush or spray. Type II (rough) walkway materials (C378 and C377) should be applied with a brush.

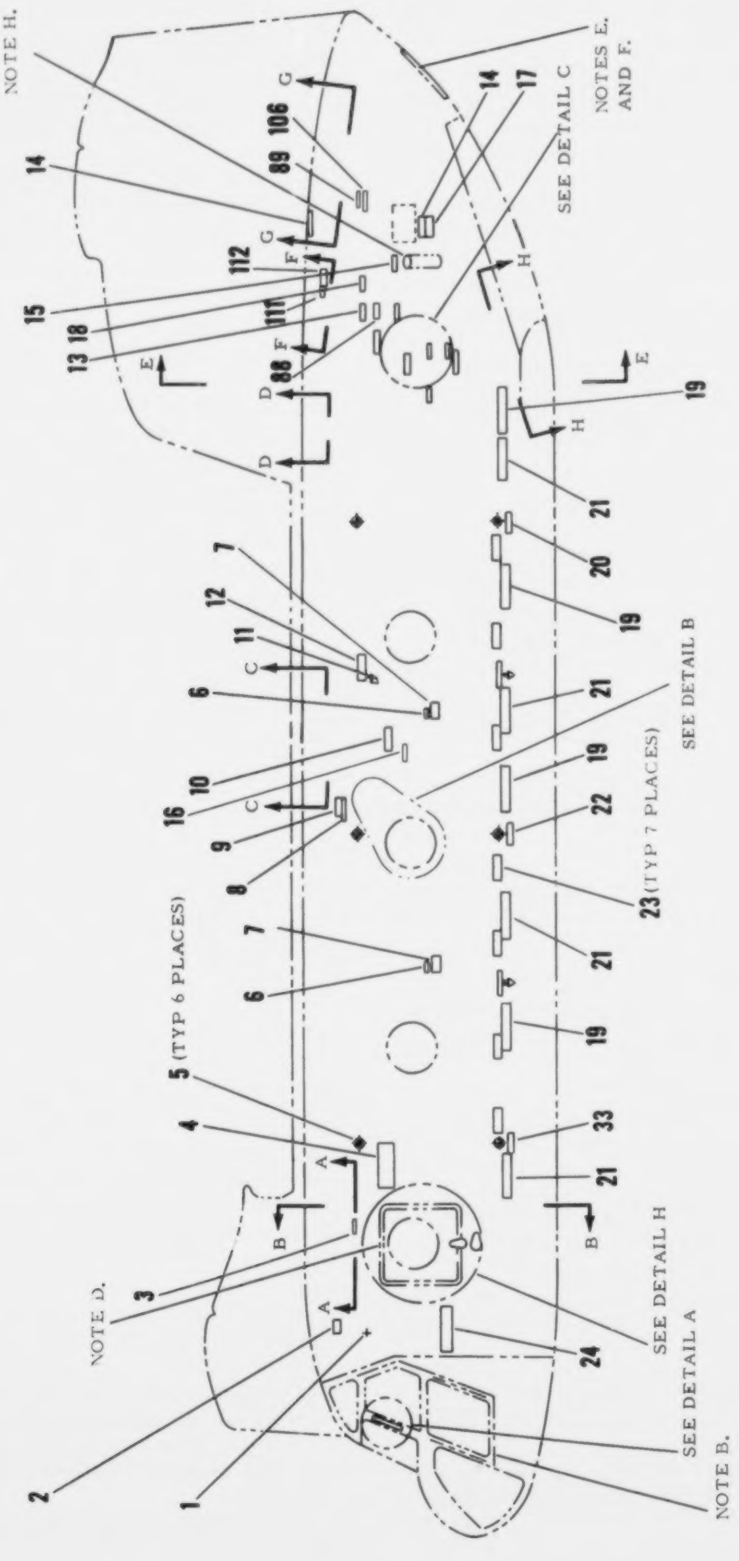
g. Apply successive coats in liberal quantities. Brush or spray on quickly. Cover a relatively small area at a time.

h. Allow each coat to dry thoroughly with a minimum of 30 minutes between coats. Avoid brushing or spraying over same coated area immediately after it has been applied.

i. Apply approximately four to five brush coats or a maximum of 10 spray coats after initial coat, unless otherwise noted.

j. Allow coated surface to air-dry a minimum of 1 hour before handling. Allow a minimum of 24 hours drying time before subjecting coated surface to light traffic. Maximum hardness is attained after approximately 7 days of air-drying.

k. Sand edges of coated surface to fair it in with adjacent areas.


RH SIDE INTERIOR
NOTE H.
NOTES E. AND F.
SEE DETAIL C
14
17
89
106
G
112
F
15
13
18
111
88
E
D
H
19
21
20
19
7
12
11
C
6
10
16
9
8
21
19
22
23 (TYP 7 PLACES)
SEE DETAIL B
5 (TYP 6 PLACES)
7
6
21
19
4
33
21
A
B
NOTE D.
3
2
1
24
SEE DETAIL H
SEE DETAIL A
SEE DETAIL B
NOTE B.

NOTE

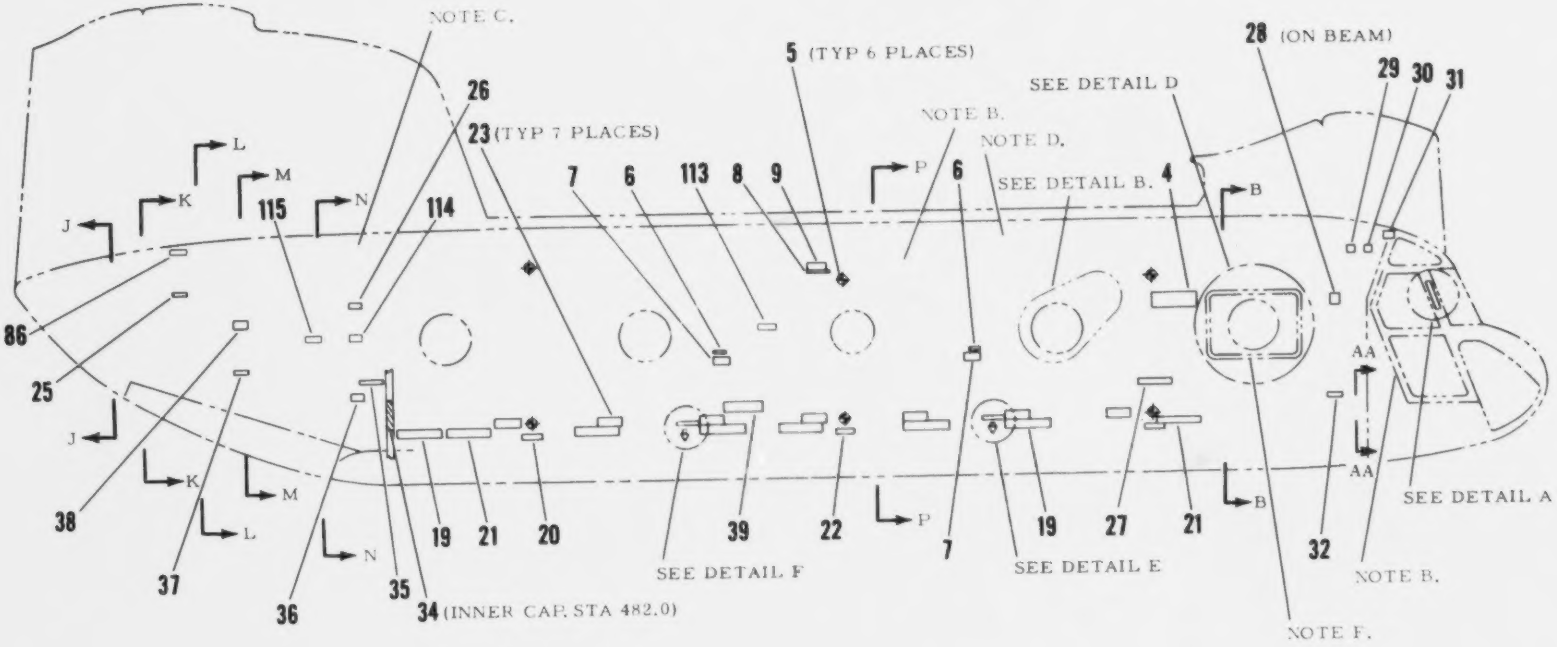
SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-34SJ ①

54x39

Figure 2-129. Internal Markings (Sheet 1 of 16)

LH SIDE INTERIOR


NOTE C.
5 (TYP 6 PLACES)
28 (ON BEAM)
29
30
31
SEE DETAIL D
26
23 (TYP 7 PLACES)
NOTE B.
NOTE D.
SEE DETAIL B.
L
M
K
N
J
115
114
7
6
113
8
9
P
6
4
B
86
25
AA
38
37
36
35
34 (INNER CAP. STA 482.0)
19
21
20
SEE DETAIL F
39
22
7
19
SEE DETAIL E
27
21
32
SEE DETAIL A
NOTE B.
NOTE F.

NOTE

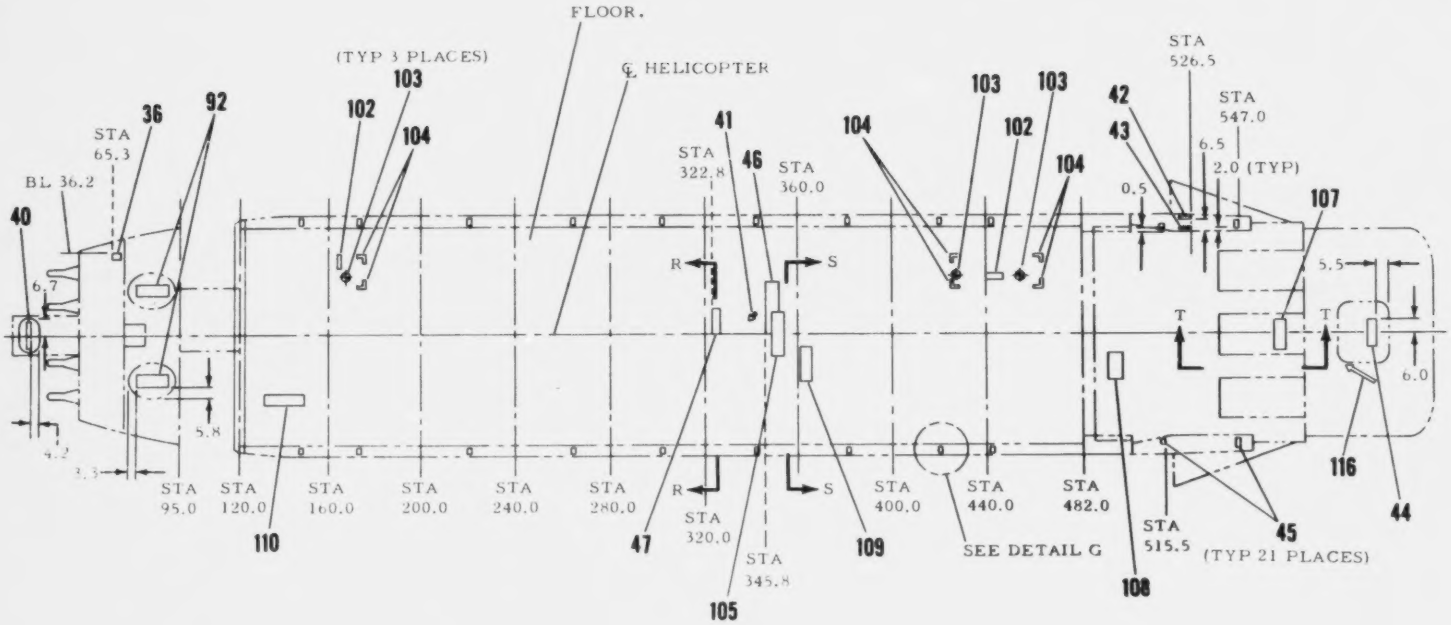
SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114 165 34S ②

54x39

Figure 2-129. Internal Markings (Sheet 2 of 16)

COCKPIT AND CABIN
(LOOKING DOWN)

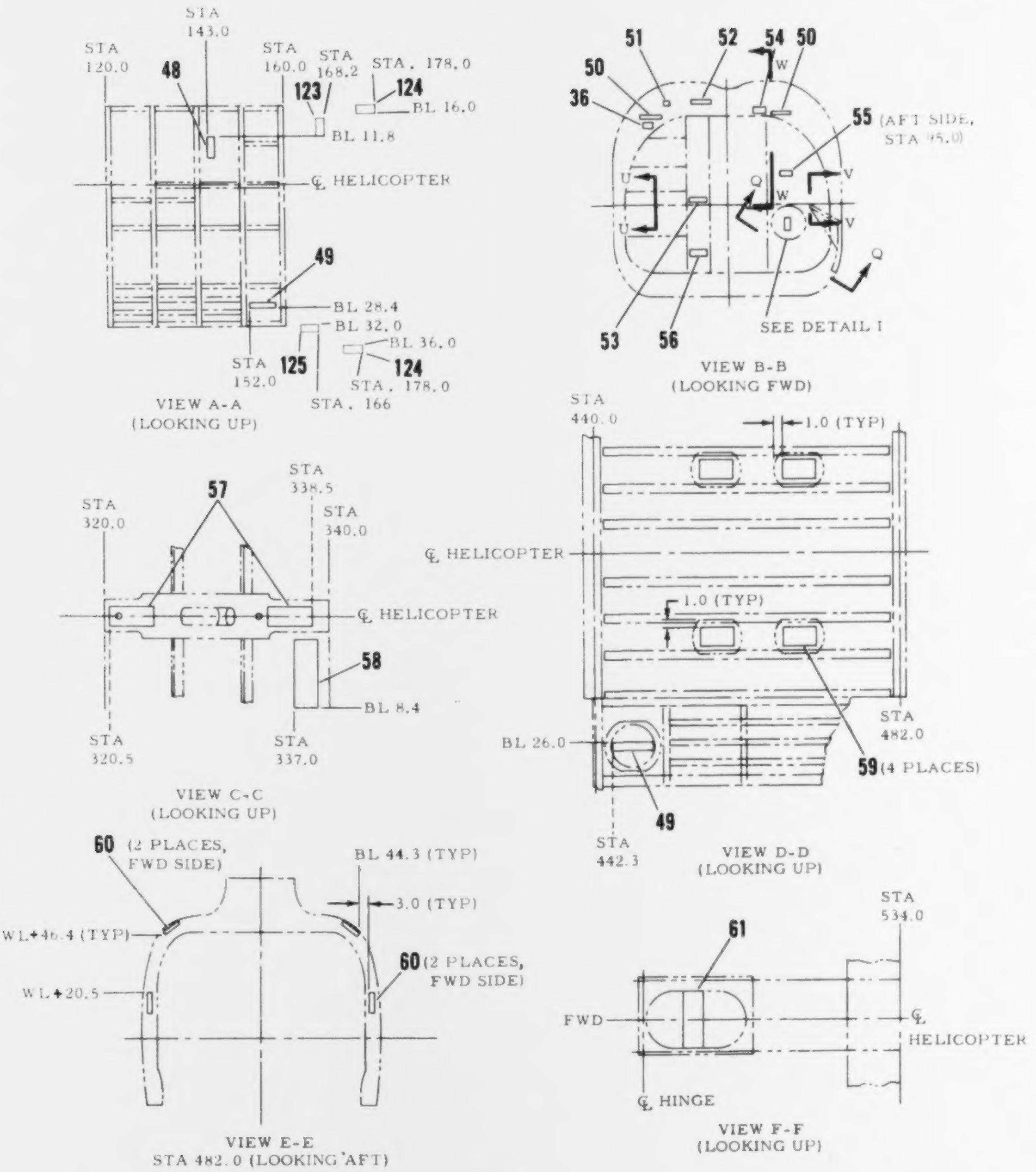

FLOOR.
℄ HELICOPTER
(TYP 3 PLACES)
40
BL 36.2
STA 65.3
36
92
102
103
104
STA 322.8
41
46
STA 360.0
104
103
102
103
104
42
43
STA 526.5
STA 547.0
6.5
2.0 (TYP)
0.5
107
5.5
6.0
T
T
R
R
S
S
6.7
4.2
3.3
5.8
STA 95.0
STA 120.0
STA 160.0
STA 200.0
STA 240.0
STA 280.0
STA 320.0
STA 345.8
STA 400.0
STA 440.0
STA 482.0
STA 515.5
110
47
105
109
SEE DETAIL G
108
45
(TYP 21 PLACES)
116
44

NOTE

A. SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-355C③

Figure 2-129. Internal Markings (Sheet 3 of 16)

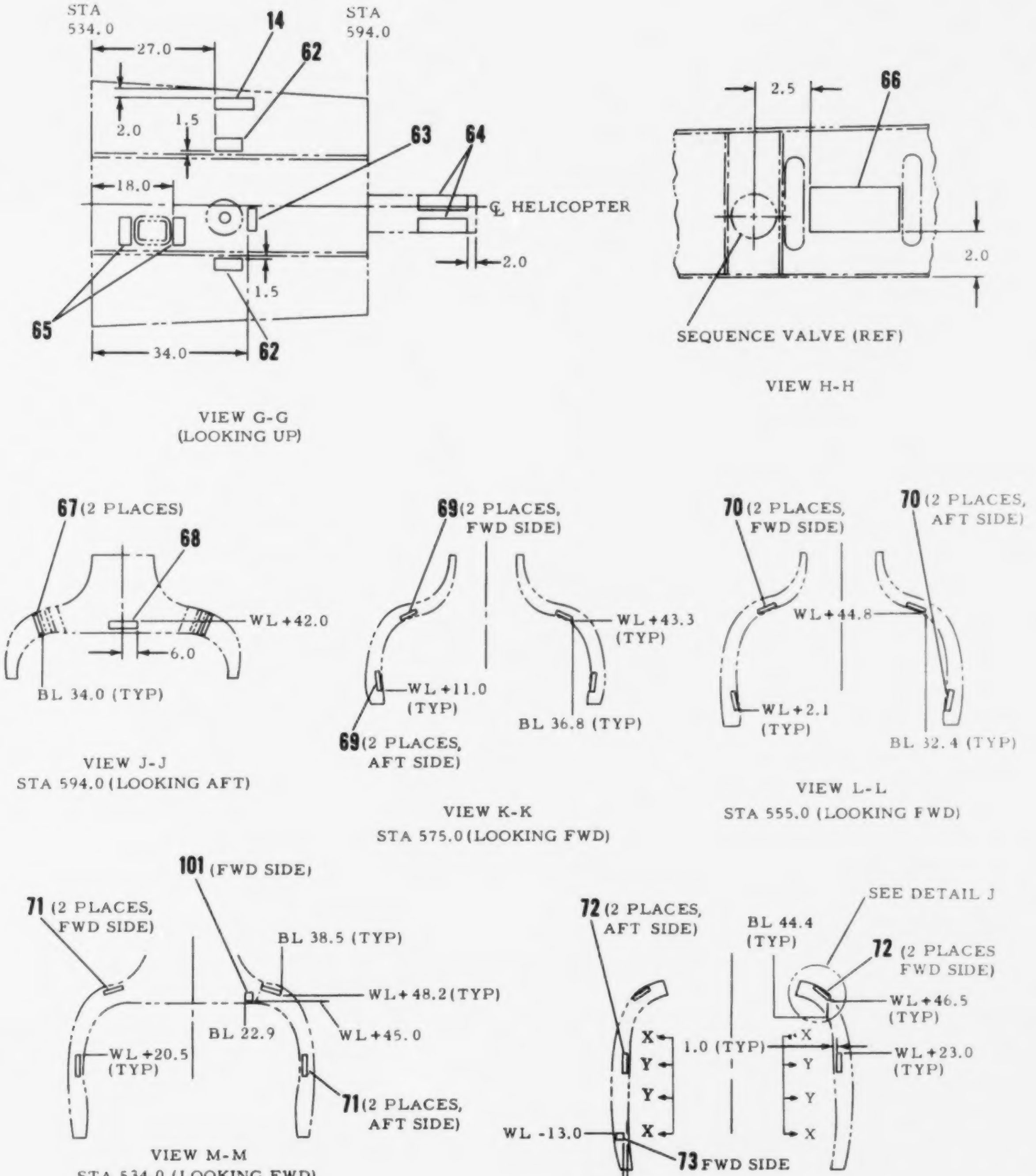

STA 143.0
STA 120.0
STA 160.0
STA 168.2
STA. 178.0
48
123
124
BL 16.0
BL 11.8
℄ HELICOPTER
49
BL 28.4
BL 32.0
BL 36.0
STA 152.0
125
124
STA. 178.0
STA. 166
VIEW A-A
(LOOKING UP)
51
52
54
50
50
36
W
55 (AFT SIDE, STA 95.0)
U
Q
V
W
U
V
Q
SEE DETAIL I
53
56
VIEW B-B
(LOOKING FWD)
STA 440.0
1.0 (TYP)
℄ HELICOPTER
1.0 (TYP)
STA 482.0
BL 26.0
59 (4 PLACES)
49
STA 442.3
VIEW D-D
(LOOKING UP)
STA 338.5
57
STA 320.0
STA 340.0
℄ HELICOPTER
58
BL 8.4
STA 320.5
STA 337.0
VIEW C-C
(LOOKING UP)
60 (2 PLACES, FWD SIDE)
BL 44.3 (TYP)
3.0 (TYP)
WL+46.4 (TYP)
60 (2 PLACES, FWD SIDE)
WL+20.5
VIEW E-E
STA 482.0 (LOOKING AFT)
STA 534.0
61
FWD
℄ HELICOPTER
℄ HINGE
VIEW F-F
(LOOKING UP)

NOTE

SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-35SC (4)

Figure 2-129. Internal Markings (Sheet 4 of 16)


STA
534.0
STA
594.0
27.0
14
62
2.0
1.5
63
64
18.0
℄ HELICOPTER
2.0
1.5
65
34.0
62
2.5
66
2.0
SEQUENCE VALVE (REF)
67 (2 PLACES)
68
WL +42.0
6.0
BL 34.0 (TYP)
69 (2 PLACES, FWD SIDE)
WL +43.3 (TYP)
WL +11.0 (TYP)
BL 36.8 (TYP)
69 (2 PLACES, AFT SIDE)
70 (2 PLACES, FWD SIDE)
70 (2 PLACES, AFT SIDE)
WL +44.8
WL +2.1 (TYP)
BL 32.4 (TYP)
101 (FWD SIDE)
71 (2 PLACES, FWD SIDE)
BL 38.5 (TYP)
WL +48.2 (TYP)
BL 22.9
WL +45.0
WL +20.5 (TYP)
71 (2 PLACES, AFT SIDE)
72 (2 PLACES, AFT SIDE)
SEE DETAIL J
BL 44.4 (TYP)
72 (2 PLACES FWD SIDE)
WL +46.5 (TYP)
X
Y
Y
X
1.0 (TYP)
X
Y
Y
X
WL +23.0 (TYP)
WL -13.0
73 FWD SIDE
2.5

VIEW G-G
(LOOKING UP)

VIEW H-H

VIEW J-J
STA 594.0 (LOOKING AFT)

VIEW K-K
STA 575.0 (LOOKING FWD)

VIEW L-L
STA 555.0 (LOOKING FWD)

VIEW M-M
STA 534.0 (LOOKING FWD)

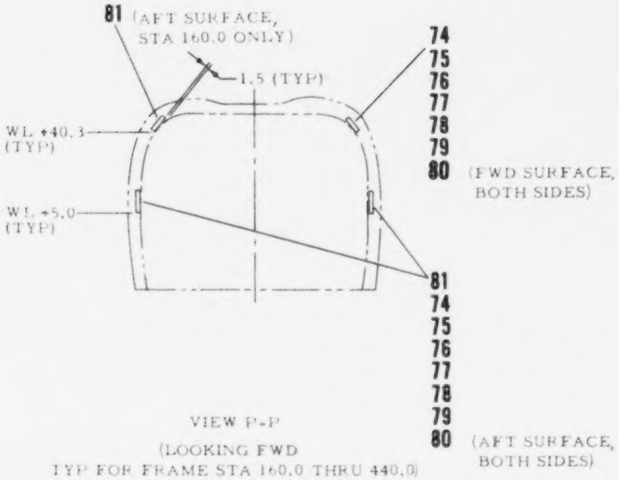
VIEW N-N
STA 502.4 (LOOKING FWD)

NOTE

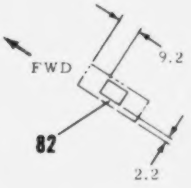
SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-35SC ⑤

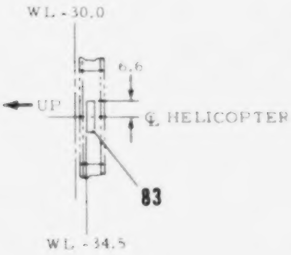
Figure 2-129. Internal Markings (Sheet 5 of 16)


81 (AFT SURFACE, STA 160.0 ONLY)
1.5 (TYP)
74
75
76
77
78
79
80 (FWD SURFACE, BOTH SIDES)
WL +40.3 (TYP)
WL +5.0 (TYP)
81
74
75
76
77
78
79
80 (AFT SURFACE, BOTH SIDES)

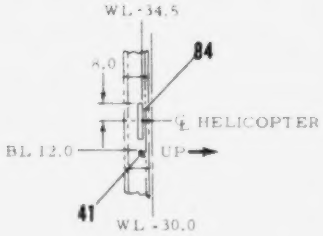
VIEW P-P
(LOOKING FWD
TYP FOR FRAME STA 160.0 THRU 440.0)



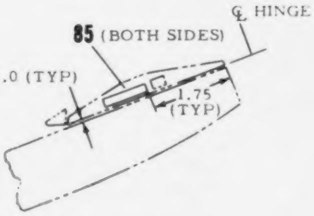
VIEW Q-Q
(DOOR CLOSED)


WL -30.0
6.6
UP
℄ HELICOPTER
83
WL -34.5

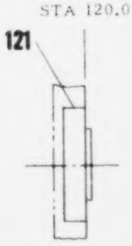
VIEW R-R
(LOOKING FWD)

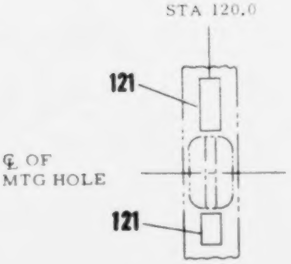

WL -34.5
8.0
84
℄ HELICOPTER
BL 12.0
UP
41
WL -30.0

VIEW S-S
(LOOKING AFT)


℄ HINGE
85 (BOTH SIDES)
1.0 (TYP)
1.75 (TYP)

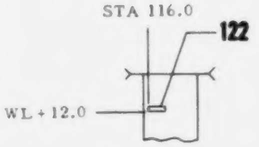
VIEW T-T


STA 120.0
121


STA 120.0
121
℄ OF MTG HOLE
121

VIEW U-U
(LOOKING OUTBD)

VIEW V-V
(LOOKING OUTBD)


STA 116.0
122
WL + 12.0

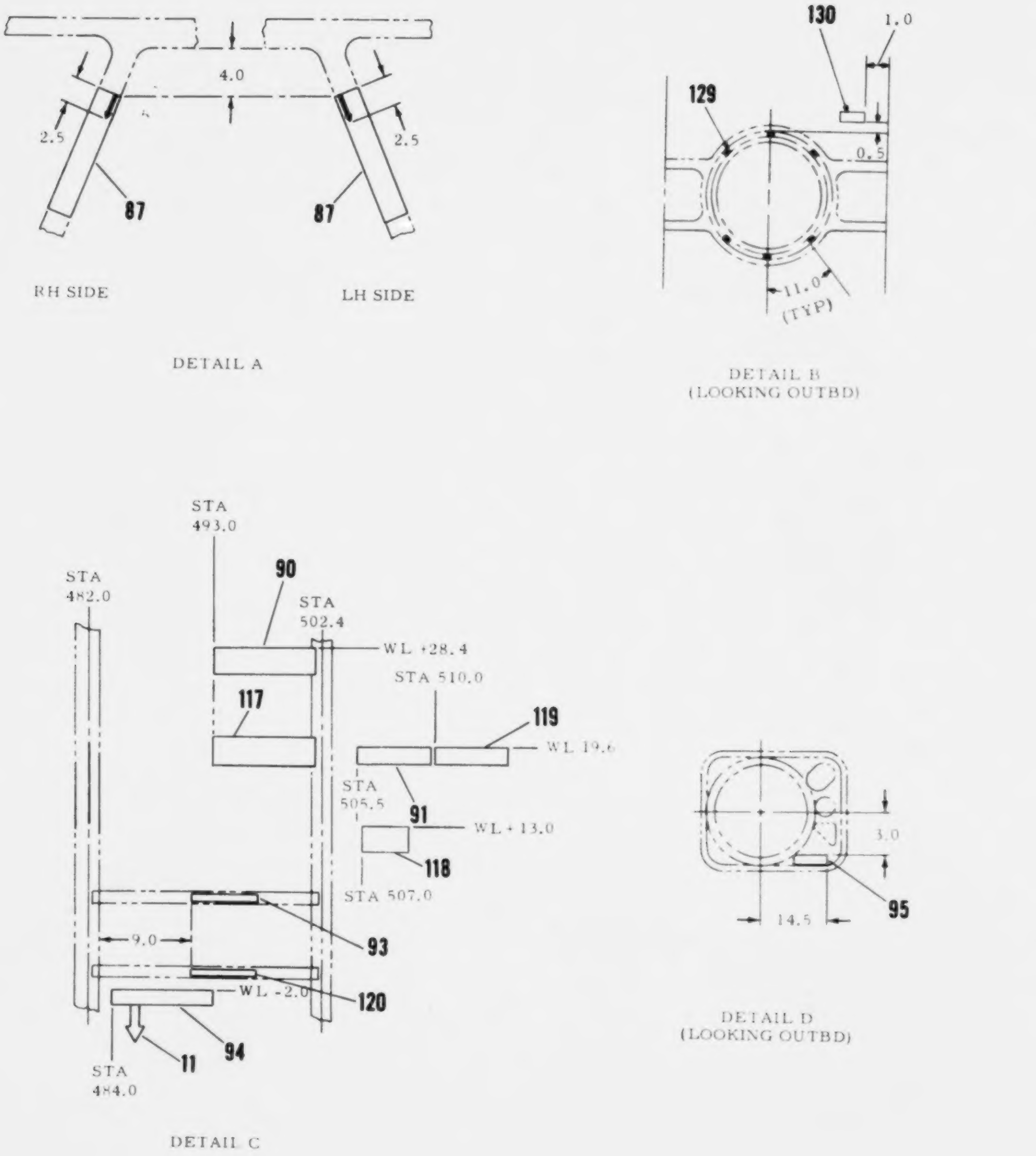
VIEW W-W
(HEATER COMPT
LOOKING INBD)

NOTE

SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-35SC⑥

Figure 2-129. Internal Markings (Sheet 6 of 16)

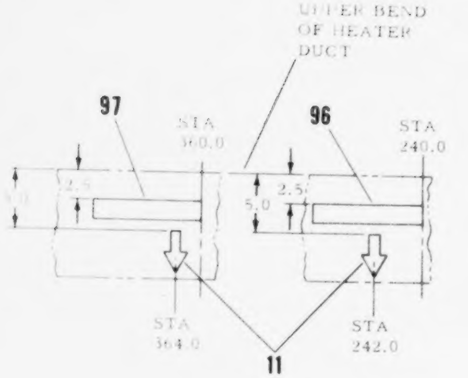

4.0
2.5
2.5
87
87
RH SIDE
LH SIDE
DETAIL A
130
1.0
129
0.5
11.0°
(TYP)
DETAIL B
(LOOKING OUTBD)
STA
493.0
90
STA
482.0
STA
502.4
WL +28.4
STA 510.0
117
119
WL 19.6
STA
505.5
91
WL +13.0
118
STA 507.0
93
9.0
120
WL -2.0
94
11
STA
484.0
DETAIL C
3.0
14.5
95
DETAIL D
(LOOKING OUTBD)

NOTE

SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

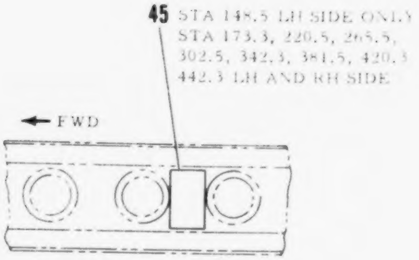
B114-165-35SC ⑦

Figure 2-129. Internal Markings (Sheet 7 of 16)

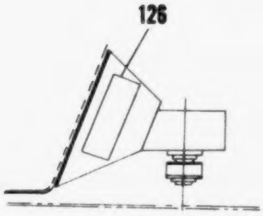

UPPER BEND
OF HEATER
DUCT
97
STA
360.0
96
STA
240.0
5.0
2.5
2.5
5.0
STA
364.0
STA
242.0
11

DETAIL F
(TYP LH AND RH SIDES)

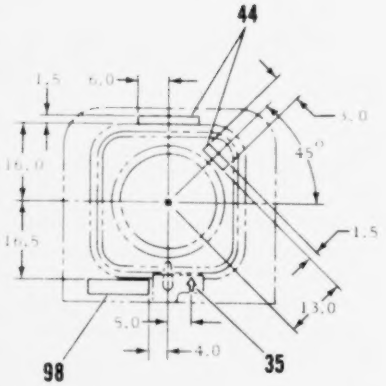
DETAIL E
(TYP LH AND RH SIDES)


45
STA 148.5 LH SIDE ONLY
STA 173.3, 220.5, 265.5,
302.5, 342.3, 381.5, 420.3
442.3 LH AND RH SIDE
FWD

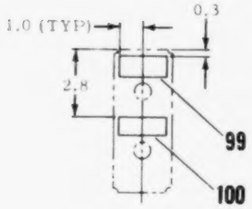
DETAIL G



DETAIL J


44
1.5
6.0
3.0
45°
16.0
16.5
1.5
13.0
5.0
4.0
98
35

DETAIL H
(LOOKING OUTBD)


1.0 (TYP)
0.3
2.8
99
100

DETAIL I

NOTE

A. SEE SHEETS 4 THRU 16 FOR DETAILS, REFERENCED INDEX NUMBERS, AND NOTES

B114-165-35SC ⑧

Figure 2-129. Internal Markings (Sheet 8 of 16)

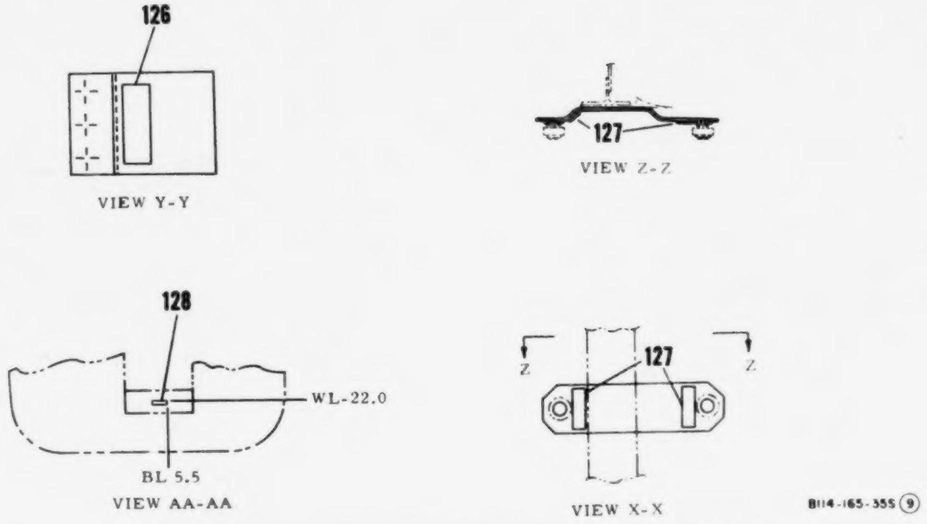


Figure 2-129. Internal Markings (Sheet 9 of 16)

2-627. Application of Non-Skid Paint (Epolux 100E6AS or Equivalent). Subsequent paragraphs contain information on the application of paint (C230).

a. Preparation before painting.

(1) Remove non-skid compound and paint using paint remover (C232). Do not allow paint remover to remain in cracks between floor panels.

NOTE

Application may be made over sound and well cured paint. Pretest a small area for lifting.

(2) Thoroughly clean surface using a cloth (C104) soaked in naphtha (C218) or toluene (C363) and wiping with an additional clean cloth. Use a wire brush to remove foreign material or imperfectly bonded paint.

(3) Remove all corrosion, using abrasive paper (C3 or C4).

(4) Flush surface with water.

(5) Prepare a diluted solution of 1 cup of ammonia (C58) to 2.5 gallons of water.

(6) Flush surface again, using diluted ammonia solution.

(7) Treat all bare surfaces in accordance with MIL-M-3171, type I.

CAUTION

Do not allow any oil or hydraulic fluids to drain on area to be painted until after final coat is completely dry. The effectiveness of bonding is only as good as the surface to which it is applied; therefore, the surface must be clean.

(8) Spray or brush one coat of primer (C266) in accordance with MIL-C-8507, and three coats of primer (C258) in accordance with MIL-P-15930.

b. Mixing paint.

(1) Prepare only the amount of paint that can be used within 24 hours after mixing.

CAUTION

Painting should be done in a well-ventilated area.

(2) Intermix contents of two containers (curing agent and pigment), thoroughly. Do not mix the sand in the paint.

c. Applying paint.

(1) Brush one coat of paint on area.

(2) Spread non-skid material (sand) lightly and as evenly as possible, while paint is wet.

NOTE

For convenience of spreading the non-skid material, treat small sections and apply sand.

(3) When temperature is above 75°F (23.9°C) and relative humidity is below 70 percent allow paint to dry for at least 12 hours. When temperature is below 75°F (23.9°C) or if a relative humidity is above 70 percent, heat lamps may be necessary and the paint should be allowed to dry for at least 24 hours.

(4) Sweep off all excess non-skid material after paint is dry.

(5) Brush a second coat of paint on area.

(6) Allow paint to dry as in step (3).

2-628. Impregnated Glass Cloth Parts Repair.

Refer to TM 55-1500-204-25/1 and TB 746-93-2 for information on repair of impregnated glass cloth parts.

2-629. Thermoplastic Parts Repair.

The information in para 2-630 is applicable to parts made of polycarbonate sheet.

2-630. Damage Repair (AVIM).

a. Clean surfaces, using clean cloths (C104) soaked with aliphatic naphtha (C217).

INDEX NO.	NOMENCLATURE	LETTER SIZE (INCHES)	COLOR (REFER TO NOTE J.)	LOCATION
1	⊕	3.0	509, 17875	⊏ STA 106.5, WL +32.5
2	NO. 2 CONTROL SYSTEM FILTER	0.5	17875	⊏ STA 106.5, WL +45.2
3	LEVELING BRACKET	0.5	17875	⊏ STA 145.2, WL +39.0
4	MAX CONCENTRATED FLOOR LOADING FWD OF STA 160.0 NOT TO EXCEED 1000 LB	1.0	17875	⊏ STA 163.5, WL +27.6
5	◐	3.0	17038, 13538	ϕ STA 181.0, 303.0, 425.0, WL +35.0 BOTH SIDES
6	UT RECP	1.0	17875	⊏ STA 249.0, 348.0, WL +8.0, BOTH SIDES
7	28 VDC AMPS: 1 = 15A 2 = 7.5A 3 = 5A	0.5	17875	⊏ STA 249.0, 348.0, WL +6.0 BOTH SIDES
8	115V, 3PH, 400CY, 15AMP	0.5	17875	⊐ STA 317.0, WL +44.9 BOTH SIDES
9	MISSILE HEAT PLUG	1.0	17875	⊐ STA 317.0, WL +41.9 BOTH SIDES
10	HOIST OPER STATION	1.0	17875	⊏ STA 335.0, WL +23.9
11	⇨	0.8x3.5	17875 BACKGROUND	STA 363.3
12	HOIST OPER ATTACH	1.0	17875	⊏ STA 363.3, WL +37.1
13	RAMP MANUAL OVERRIDE	0.5	17875	⊏ STA 506.0, WL +36.0
14	ACCUMULATOR CHARGE 1400 PSI-AIR OR NITROGEN	0.5	17875	⊐ STA 549.3, WL +53.0 538.8, WL +8.5
15	FILLER-UTILITY TANK	0.5	17875	⊏ STA 525.0, WL +22.5
16	ANTENNA-VOR AN/ARN-82	0.5	17875	⊏ STA 330.5, WL +16.6
17	INITIAL 1800 PSI CHARGE REQD FOR -65°F OPERATION	0.5	17875	⊏ STA 538.8, WL +8.5
18	UTILITY PRESSURE FILTER	0.5	17875	⊏ STA 517.5, WL +36.0

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Figure 2-129. Internal Markings (Sheet 10 of 16)

INDEX NO.	NOMENCLATURE	LETTER SIZE (INCHES)	COLOR (REFER TO NOTE J.)	LOCATION
19	10000 LB TIE DOWN HERE ONLY	1.0	17875	STA 391.0, 460.2, WL -21.5
20	CARGO E STA 425 CAP 22875 LBS	1.0 0.5	17875	STA 428.8
21	ALL TIE DOWN RINGS 5000 LBS UNLESS NOTED	1.0	17875	STA 438.7, WL -21.5
22	CARGO D STA 303 CAP 22875 LBS	1.0 0.5	17875	STA 306.8
23	HEAT AND VENT LOOSEN SCREW TO ADJUST SLIDE OPEN ←——→ CLOSED	1.0 0.5	17875	STA 285.0, 360.0
24	TO STOW SEAT-FOLD BACK FWD & SECURE WITH STRAP-FOLD SEAT DOWN	1.0	17875	ON RH BEAM
25	MIRROR STOWAGE	0.5	17875	STA 561.0, WL +33.4
26	☐ FUEL VALVE NO. 1 ENGINE ←—OPEN CLOSE—→	0.5 0.25	17875	STA 492.0, WL +28.4
27	DO NOT COVER AIR INLET	1.0	17875	STA 184.7, WL -63
28	TORQUE MTG BOLTS FOR 114CS101 & 114CS117 TO 40^{+0}_{-4} IN. LBS	0.25	17875	STA 106.0, WL +26.0 ON BL 8.0 BEAM
29	NO 1 SAS FILTER	0.5	17875	STA 100.0, WL +45.2
30	NO 2 SAS FILTER	0.5	17875	STA 94.0, WL +45.2
31	NO 1 CONTROL SYSTEM FILTER	0.5	17875	STA 85.0, WL +50.8
32	PITOT AND STATIC DRAINS	0.5	17875	STA 106.0, WL -13.5
33	CARGO C STA 181 CAP 22875 LBS	1.0 0.5	17875	STA 184.8
34	▨	2.0x13.0	11105 17875	STA 482.0 ON INNER CAP OF FRAME
35	STA 486.0	1.0	17875	STA 484.0, WL-2.0
36	FIRE EXT.	1.0	17875	STA 4920, WL-6.5 BL 37.0, WL +38.7
37	COMPASS FLUX VALVE	0.5	17875	STA 537.0, WL +3.4
38	EMERGENCY APU FLUID SHUTOFF VALVE CLOSE OPEN	0.5 0.25	17875	STA 537.0, WL +22.2

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Figure 2-129. Internal Markings (Sheet 11 of 16)

INDEX NO.	NOMENCLATURE	LETTER SIZE (INCHES)	COLOR (REFER TO NOTE J.)	LOCATION
39	CRANK STOWAGE-RESCUE HATCH & RAMP MECH	1.0	17875	⊏+ STA 334.0, WL -12
40	ACCESS-PITOT AND STATIC DRAIN LINES	0.5	17875	CENTER ON DOOR
41	⇨	0.8x3.5	17038 BACKGROUND	
42	FILLING	0.5	17875	
43	NORMAL	0.5	17875	
44	EMERGENCY EXIT PULL STRAP OUT-PUSH PANEL	1.0 0.5	33538	
45	WL 0	1.0	17875	
46	TURN LATCH TO UNLOCK & LOCK OUTER HATCH-CAUTION-UNLOCK BEFORE TURNING CRANK TO OPEN HATCH	1.0	13538 17875	ON LOWER DOOR
47	UNLOCK ↶	1.0	17875	ON LOWER DOOR
48	STATIC DRAIN LINE	0.5	17875	
49	CRANE ACCESS	0.5	17875	
50	STA 120	1.0	17875	BL 38.0, WL +40.5 +⊐ BL 28.5, WL +43
51	TROOP WARNING SYSTEM	0.25	17875	⊏+ BL 25.3, WL +48
52	RESCUE PULLEY ATTACH	0.5	17875	+⊐ BL 15.5, WL +48
53	LITTER POLE STOWAGE	1.0	17875	+⊐ BL 17.2, WL +3.9
54	ANCHOR LINE ATTACH	0.5	17875	+⊐ BL 12.0, WL +45
55	CABIN LIGHT RELAYS RED WHITE	0.25	17875	⊏+ BL 29.0, WL +15.5
56	WINCH CABLE STOWAGE	1.0	17875	+⊐ BL 17.2, WL -20
57	RESCUE CABLE CUTTER-PULLEY ATTACH	0.25	17875	
58	CABLE CUTTER PLUG	0.5	17875	
59	ACCESS MIX BOX MOUNTING BOLTS	0.5	17875	
60	STA 482	1.0	17875	FORWARD SIDE
61	ACCESS-SYNCH SHAFT THOMAS CPLG.	0.5	17875	CENTER ON DOOR
62	ACCESS XMSN-UNLATCH DROP PANEL	0.5	17875	

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Figure 2-129. Internal Markings (Sheet 12 of 16)

INDEX NO.	NOMENCLATURE	LETTER SIZE (INCHES)	COLOR (REFER TO NOTE J.)	LOCATION
63	ACCESS-MAG PLUG	0.5	17875	
64	NO HANDHOLD	1.0	17875	
65	XMSN OIL LEVEL SIGHT GAGE VIEW PLATE	0.5	17875	
66	SEQUENCE VALVE	0.5	17038	
67	STA 594	1.0	17875	FORWARD-SIDE
68	↑DANGER HIGH VOLTAGE↑	1.0	13538	
69	STA 575	1.0	17875	
70	STA 554	1.0	17875	
71	STA 534	1.0	17875	
72	STA 502.4	1.0	17875	
73	HOIST CONTROL ↓	0.5	17875	
74	STA 200	1.0	17875	
75	STA 240	1.0	17875	
76	STA 280	1.0	17875	
77	STA 320	1.0	17875	
78	STA 360	1.0	17875	
79	STA 400	1.0	17875	
80	STA 440	1.0	17875	
81	STA 160	1.0	17875	
82	PUSH TRIGGER TURN HANDLE UP PUSH DOOR OUT	1.0	17875	
83	CARGO HOOK CAP 20000 LB	1.0	17038	
84	HOOK STOWAGE STRAP	1.0	37038	
85	MAX WEIGHT 200 LBS ON WORK PLATFORM	0.5	17875	
86	ACCUMULATOR CHARGE 1400 PSI-AIR OR NITROGEN	0.5	17875	⊏+ STA 561.0, WL +49
87	EMERGENCY EXIT TURN HANDLE	1.0 0.5	33538	

42 x 51

8114-165-345R⑬

Figure 2-129. Internal Markings (Sheet 13 of 16)

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. ENTIRE INTERIOR OF HELICOPTER TO BE DARK GULL GRAY, ANA COLOR NO. 621, FED. COLOR NO. 36231, EXCEPT SURFACES ABOVE WATERLINE +29.0 TO BE APPLICABLE PRIMER COLOR ONLY. SURFACES REQUIRING APPLICATION OF VELCRO TAPE SHOULD BE PROPERLY MASKED PRIOR TO APPLICATION OF FINAL FINISHES

C. RESTORE OBLITERATED LINE MARKINGS IN ACCORDANCE WITH AND10375 AS REQUIRED

D. MARKINGS COVERED BY BLANKET INSTALLATIONS ARE TO BE REPEATED ON THE BLANKET OUTER SURFACE

E. EMERGENCY EXIT MARKINGS ARE TO BE ORANGE-YELLOW. COLOR NO. 13538 OR 33538, AS REQUIRED, ON A BLACK BACKGROUND. COLOR NO. 37038 OR 17038, AS REQUIRED

F. ESCAPE PANELS REQUIRE THE COMPLETE PERIPHERY TO BE MARKED BY A 1.0 TO 2.0 WIDE BAND, HALF ON STRUCTURE AND HALF ON PANEL

G. ARROWS INDICATING COMPARTMENT LIMITS AND CENTROIDS MUST BE IN EXACT LOCATION

H. FINISH HALF OF FILLER CAP, LIGHT YELLOW. COLOR NO. 136551 THE OTHER HALF, LIGHT BLUE, COLOR NO. 15102

I. SYMBOLS USED IN THE LOCATION COLUMN OF THE CHART INDICATE ORIENTATION OF THE DECAL WITH RESPECT TO THE STATION LINE AND WATERLINE OR BUTT LINE AS FOLLOWS:

+□ LH EDGE ON STATION LINE AND TOP EDGE ON WATERLINE OR BUTT LINE

□+ RH EDGE ON STATION LINE AND TOP EDGE ON WATERLINE OR BUTT LINE

□+ RH EDGE ON STATION LINE AND BOTTOM EDGE ON WATERLINE OR BUTT LINE

Φ CENTERED ON STATION LINE

J. THE NUMBER IN THE COLOR COLUMN IS THE FED. STD 595 OR ANA COLOR NO.

K. EFFECTIVITY SYMBOLS USED IN NOMENCLATURE COLUMN ARE AS FOLLOWS:

□ USED ON HELICOPTERS 66-19098 THRU 67-18463

○ USED ON HELICOPTERS 67-18464 AND SUBSEQUENT

△ USED ON HELICOPTERS 68-15810 AND SUBSEQUENT

42x38

B114-294-345V

Figure 2-129. Internal Markings (Sheet 16 of 16)

b. Lightly sand surfaces, using 320-grit abrasive paper (C3 or C4).

c. Repeat step a.

d. Prepare a patch and/or insert of polycarbonate sheet (C?53) as follows:

(1) Cut patch to extend a minimum of 0.5 inch from edge of hole.

(2) Form patch, if required, by heating it in an oven for 3 to 5 minutes at 350°F (177°C).

(3) Clean patch. (Refer to steps a., b., and c.)

e. Prepare and apply adhesive (C50 or C51) to faying surfaces of part and patch. Refer to para 2-542.

f. Position patch on part and apply light pressure for length of cure time.

g. Refinish repaired area, if required, as follows:

(1) Clean area to be refinished using clean cloths (C104) soaked with aliphatic naphtha (C217).

(2) Prepare a mixture of 3 parts of bake coating EV-6174 (C66) of desired color, with 1 part, by volume, of Logo thinner (C358).

(3) Spray one coat of the mixture on area. Allow to air dry 30 minutes. Bake at 275°F (135°C) for 1 hour.

(4) Repeat step (3).

2-631. Sandwich Honeycomb Repairs.

The sandwich honeycomb structures used in the construction of this helicopter consists of an aluminum alloy honeycomb core (density and thickness vary) sandwiched between aluminum alloy skins (material, thickness, and face patterns vary). In some instances, such as pod formers and skin panels, edge members made of Scotchply, a non-woven, impregnated, glass fabric, enclose the transition of skins and core and in others, such as work platforms, and free edges are filled with Corfil 615. The effectiveness of repairs to these structures depends upon the analysis and classification of a particular damage and the application of the proper type repair and repair techniques.

2-632. Classifications of Damage.

Dents: Dents to surface skin are limited to 50 square inches per dent. The maximum allowable dented area to any one pod shall not exceed 200 square inches. Dents shall not be deeper than 20 percent of panel thickness or 0.25 inch, whichever is less. The dents must be free of fractures or punctures and must not occur more than twice in any 40 inch length of panel.

Refer to TM 55-1500-204-25/1 for damage classifications to honeycomb sandwich parts.

2-633. Formed Parts Repair.

Refer to figure 2-129.1 for information concerning formed parts repair.

2-634. Extruded Parts Repair.

Refer to figure 2-129.2 for information concerning extruded parts repair.

2-635. Oilcan Inspection and Repair.

The information provides acceptance standards for oilcan, normal skin, soft or loose skin, and trapped skin. Repair procedures of unacceptable conditions are also included. Para 2-641 and 2-642 are applicable to entire aircraft with the exception of bottom skin areas.

2-636. Bottom Skin Oilcan Inspection.

Paragraphs 2-637 thru 2-640 define inspection standards for bottom skin in cockpit, cabin, and aft fuselage areas. See fig. 2-5 for identification of bottom skin.

2-637. Oilcan.

a. Press inward on surface deformation of skin between boundary members such as: transverse and longitudinal longerons, stringers, stiffeners, and grames. If skin stays in and reappears as an outward bulge in an adjacent bay, the condition is acceptable.

b. Press inward on surface deformation of skin between boundary members of a single bay. If skin produces a popping sound when pressed and released, the condition is acceptable.

2-638. Normal Skin. Press inward on a flat skin which does not contain a bulge or depression or a curved skin with an acceptable contour. If skin returns to its normal position when pressure is removed, the condition is acceptable.

2-639. Soft or Loose Skin. Press inward on skin which exhibits a noticeable ripple effect. If skin does not produce a popping sound when pressed and released, the condition is acceptable.

2-640. Trapped Skin. Trapped skin is buckled outward or inward between panel attachments. It is generally accompanied by an inward or outward sharp crease or depression. This condition is not acceptable.

2-641. Single Bay Oilcan Inspection.

a. Press inward on skin between boundary members such as transverse and longitudinal longerons, stringers, stiffeners, and frames. If skin stays in and reappears as a bulge elsewhere in the single bay, reject area.

b. Repeat step a. If skin produces a popping sound when pressed and released, the area is not considered an oilcan and is acceptable.

NOTE

Pressure on the bulge of unacceptable areas should cause area that was originally depressed to pop outward again. Skin that can be pressed in and out without producing a popping sound, but causes skin motion across two or more boundary members in any direction, is considered loose skin and is acceptable.

2-642. Multi-Bay Oilcan Inspection.

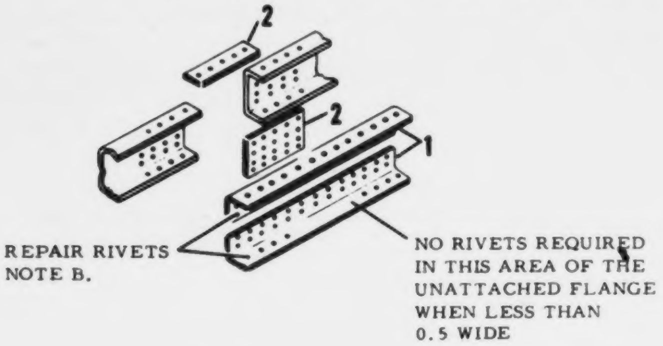
a. Press inward on skin within a single bay and observe if skin pops outward in an adjacent bay. Pressure on new bulge in adjacent bay should cause skin to pop outward where it was originally depressed. This condition is unacceptable.

b. Press inward on skin within a single bay and observe if skin buckles outward in more than one adjacent bay by crossing boundary members. This condition is considered an oilcan and is not acceptable.

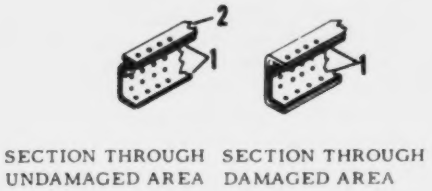
NOTE

To determine if area is buckled or not, first apply and maintain pressure on a single bay. Then, apply pressure to resulting outward bulge in an adjacent bay, and slowly relieve pressure on first area. If first depressed area tends to bulge out when pressure is relieved, the area is considered as buckled. If area does not bulge out, the area is considered not buckled.

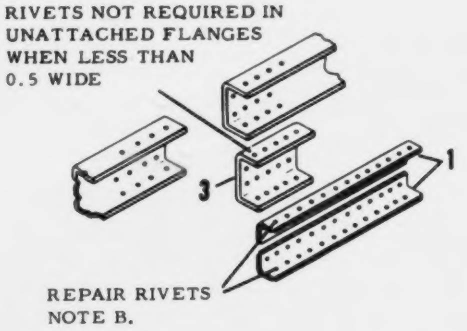
REPAIRS FOR DAMAGED CHANNELS HAVING A WEB GREATER THAN 1.5 WIDE


2
2
1
REPAIR RIVETS
NOTE B.
NO RIVETS REQUIRED
IN THIS AREA OF THE
UNATTACHED FLANGE
WHEN LESS THAN
0.5 WIDE

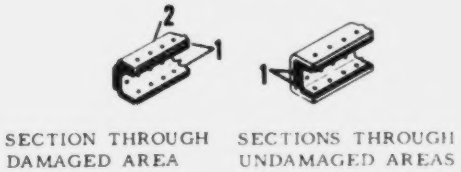
ALTERNATE METHOD


2
1
1
SECTION THROUGH
UNDAMAGED AREA
SECTION THROUGH
DAMAGED AREA

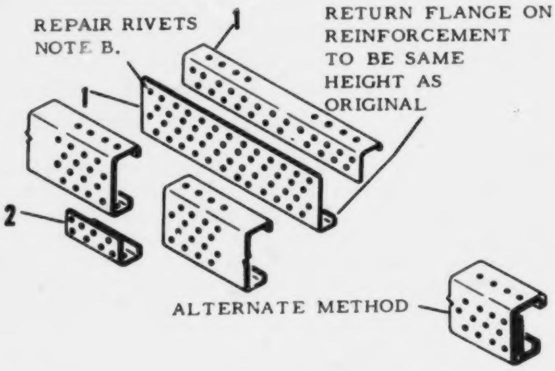
REPAIRS FOR DAMAGED CHANNELS HAVING A WEB LESS THAN 1.5 WIDE


RIVETS NOT REQUIRED IN
UNATTACHED FLANGES
WHEN LESS THAN
0.5 WIDE
3
1
REPAIR RIVETS
NOTE B.

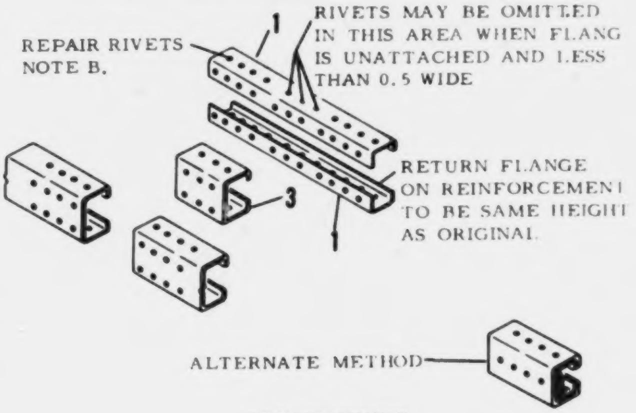
ALTERNATE METHOD


2
1
1
SECTION THROUGH
DAMAGED AREA
SECTIONS THROUGH
UNDAMAGED AREAS

REPAIRS FOR DAMAGED CHANNELS HAVING RETURN FLANGES AND A WEB GREATER THAN 1.5 WIDE


REPAIR RIVETS
NOTE B.
1
RETURN FLANGE ON
REINFORCEMENT
TO BE SAME
HEIGHT AS
ORIGINAL
1
2
ALTERNATE METHOD

REPAIRS FOR DAMAGED CHANNELS HAVING RETURN FLANGES AND A WEB LESS THAN 1.5 WIDE


REPAIR RIVETS
NOTE B.
1
RIVETS MAY BE OMITTED
IN THIS AREA WHEN FLANG
IS UNATTACHED AND LESS
THAN 0.5 WIDE
RETURN FLANGE
ON REINFORCEMENT
TO BE SAME HEIGHT
AS ORIGINAL
3
1
ALTERNATE METHOD

NOTES

A. ALL DIMENSIONS ARE IN INCHES

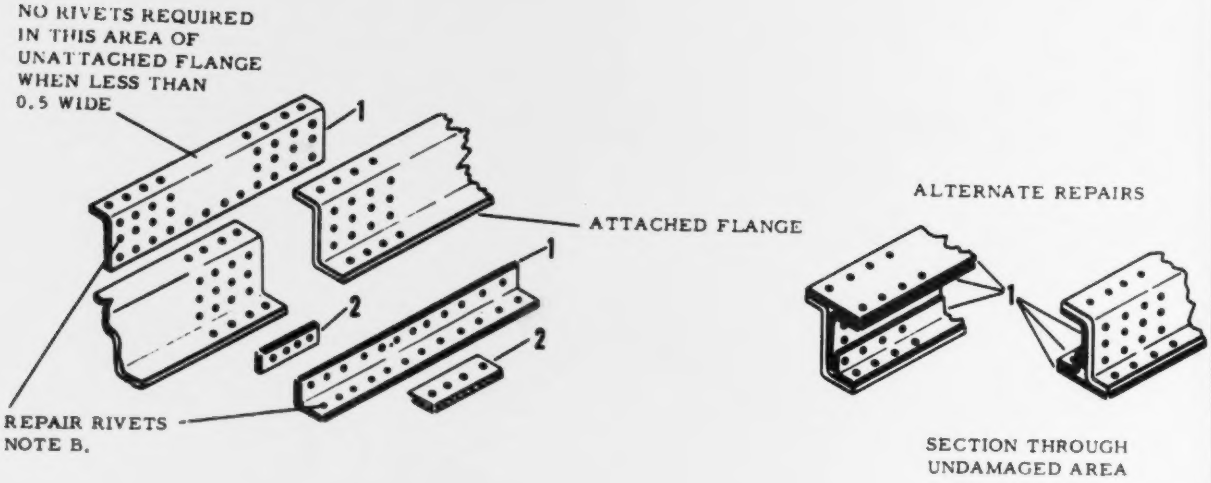
B. THE MINIMUM OF RIVETS IN EACH ROW EACH SIDE OF DAMAGE IS: FOUR IN 2024 AND SIX IN 7075 AND CORROSION RESISTANT STEEL

REPAIR PARTS

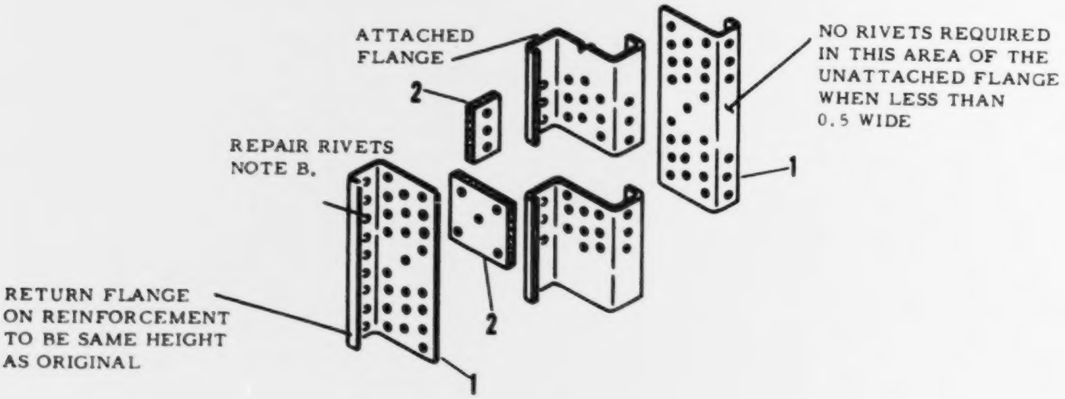
1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS OR SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. FILLER. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL.
3. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL.

Figure 2-129.1 Formed parts repairs(Sheet 1 of 6)

REPAIRS FOR DAMAGED ZEE SECTIONS


NO RIVETS REQUIRED IN THIS AREA OF UNATTACHED FLANGE WHEN LESS THAN 0.5 WIDE
1
ATTACHED FLANGE
1
2
2
REPAIR RIVETS NOTE B.
ALTERNATE REPAIRS
1
SECTION THROUGH UNDAMAGED AREA

REPAIRS FOR DAMAGED Z-SECTIONS HAVING RETURN FLANGES


ATTACHED FLANGE
2
NO RIVETS REQUIRED IN THIS AREA OF THE UNATTACHED FLANGE WHEN LESS THAN 0.5 WIDE
REPAIR RIVETS NOTE B.
1
2
RETURN FLANGE ON REINFORCEMENT TO BE SAME HEIGHT AS ORIGINAL
1

NOTES

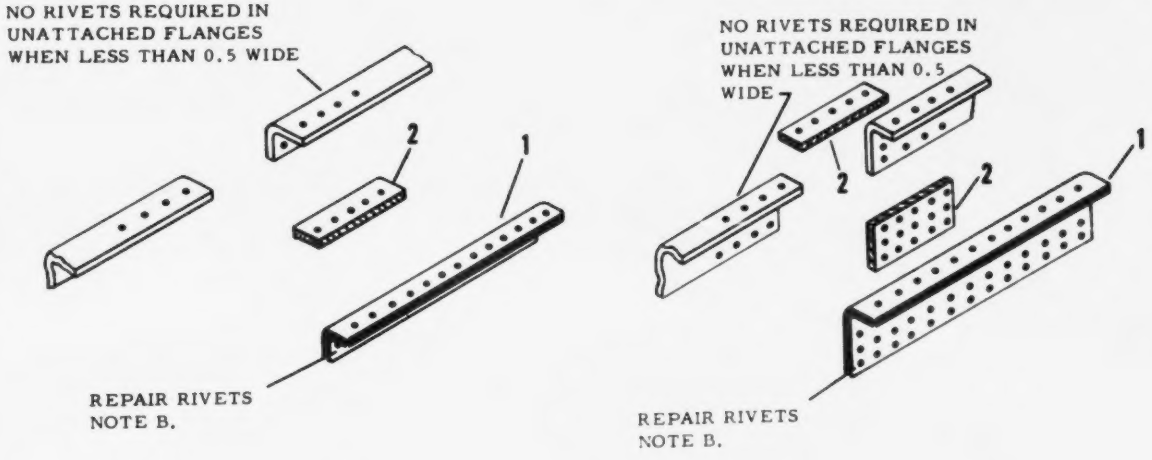
A. ALL DIMENSIONS ARE IN INCHES

B. THE MINIMUM OF RIVETS IN EACH ROW EACH SIDE OF DAMAGE IS: FOUR IN 2024 AND SIX IN 7075 AND CORROSION RESISTANT STEEL

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS OR SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. FILLER. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

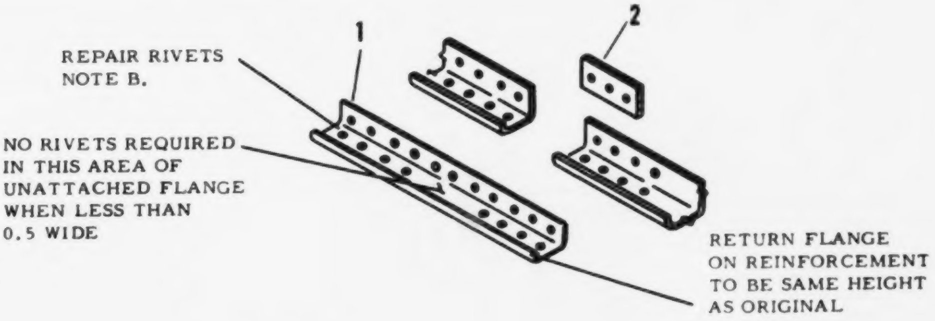
Figure 2-129.1 Formed parts repairs (Sheet 2 of 6)



REPAIR FOR DAMAGED ANGLES LESS THAN 1.5 WIDE

REPAIR FOR DAMAGED ANGLES GREATER THAN 1.5 WIDE

NO RIVETS REQUIRED IN UNATTACHED FLANGES WHEN LESS THAN 0.5 WIDE
2
1
REPAIR RIVETS NOTE B.
NO RIVETS REQUIRED IN UNATTACHED FLANGES WHEN LESS THAN 0.5 WIDE
2
1
2
REPAIR RIVETS NOTE B.



REPAIR FOR DAMAGED ANGLES HAVING RETURN FLANGES

REPAIR RIVETS NOTE B.
1
2
NO RIVETS REQUIRED IN THIS AREA OF UNATTACHED FLANGE WHEN LESS THAN 0.5 WIDE
RETURN FLANGE ON REINFORCEMENT TO BE SAME HEIGHT AS ORIGINAL

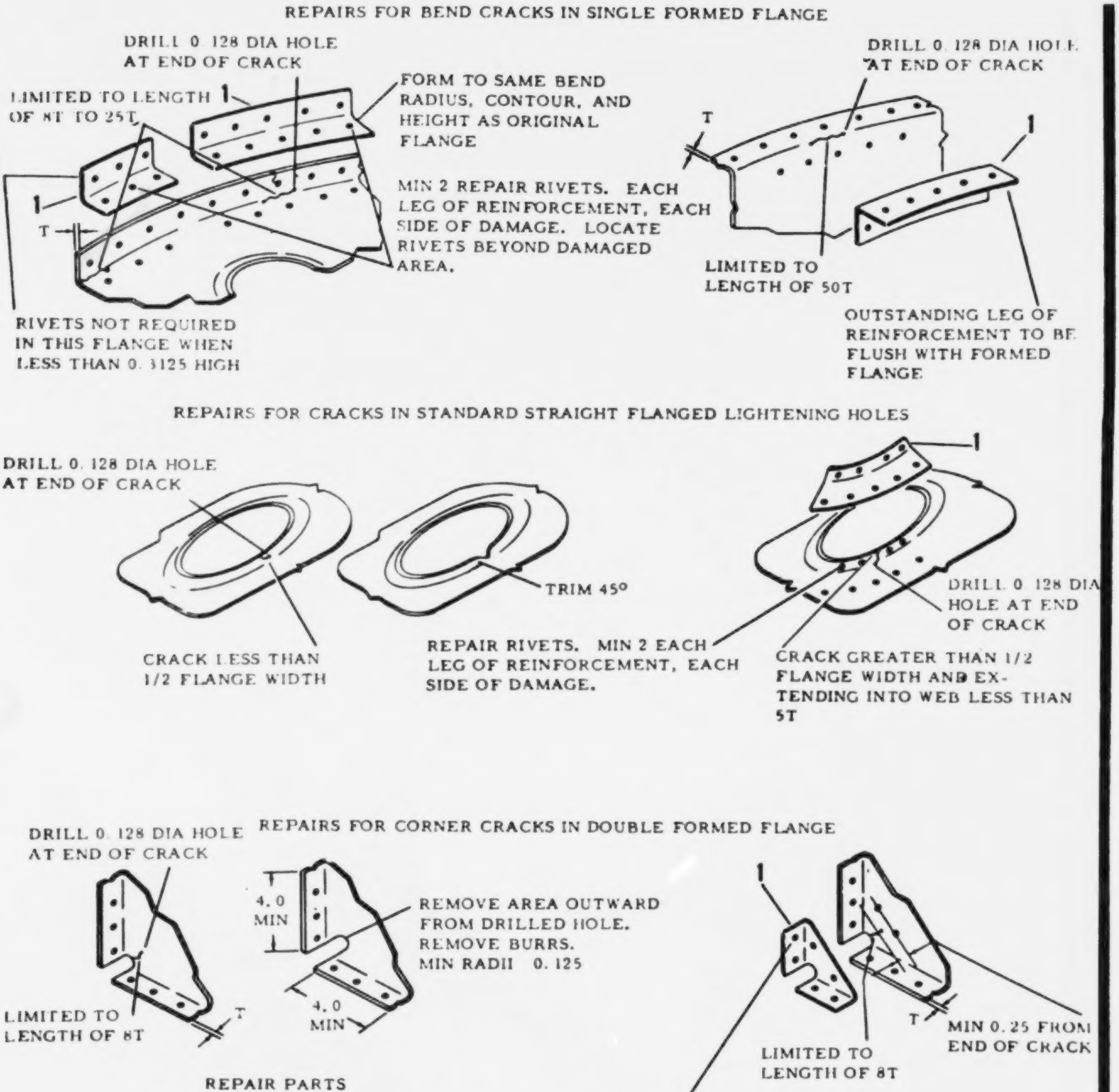
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. THE MINIMUM NUMBER OF RIVETS IN EACH ROW EACH SIDE OF DAMAGE ARE: FOUR IN 2024 AND SIX IN 7075 AND CORROSION-RESISTANT STEEL

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS OR SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST .
2. FILLER. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

Figure 2-129.1 Formed parts repairs (Sheet 3 of 6)


REPAIRS FOR BEND CRACKS IN SINGLE FORMED FLANGE
DRILL 0.128 DIA HOLE AT END OF CRACK
LIMITED TO LENGTH OF 8T TO 25T
1
FORM TO SAME BEND RADIUS, CONTOUR, AND HEIGHT AS ORIGINAL FLANGE
MIN 2 REPAIR RIVETS. EACH LEG OF REINFORCEMENT, EACH SIDE OF DAMAGE. LOCATE RIVETS BEYOND DAMAGED AREA.
1
T
RIVETS NOT REQUIRED IN THIS FLANGE WHEN LESS THAN 0.3125 HIGH
DRILL 0.128 DIA HOLE AT END OF CRACK
T
1
LIMITED TO LENGTH OF 50T
OUTSTANDING LEG OF REINFORCEMENT TO BE FLUSH WITH FORMED FLANGE
REPAIRS FOR CRACKS IN STANDARD STRAIGHT FLANGED LIGHTENING HOLES
DRILL 0.128 DIA HOLE AT END OF CRACK
1
TRIM 45°
DRILL 0.128 DIA HOLE AT END OF CRACK
CRACK LESS THAN 1/2 FLANGE WIDTH
REPAIR RIVETS. MIN 2 EACH LEG OF REINFORCEMENT, EACH SIDE OF DAMAGE.
CRACK GREATER THAN 1/2 FLANGE WIDTH AND EXTENDING INTO WEB LESS THAN 5T
DRILL 0.128 DIA HOLE AT END OF CRACK
REPAIRS FOR CORNER CRACKS IN DOUBLE FORMED FLANGE
4.0 MIN
REMOVE AREA OUTWARD FROM DRILLED HOLE. REMOVE BURRS. MIN RADII 0.125
1
LIMITED TO LENGTH OF 8T
T
4.0 MIN
T
MIN 0.25 FROM END OF CRACK
LIMITED TO LENGTH OF 8T
MIN 6 RIVETS. USE EXISTING RIVET LOCATIONS. USE SAME TYPE RIVET AS ORIGINAL IN NEXT LARGER DIAMETER.

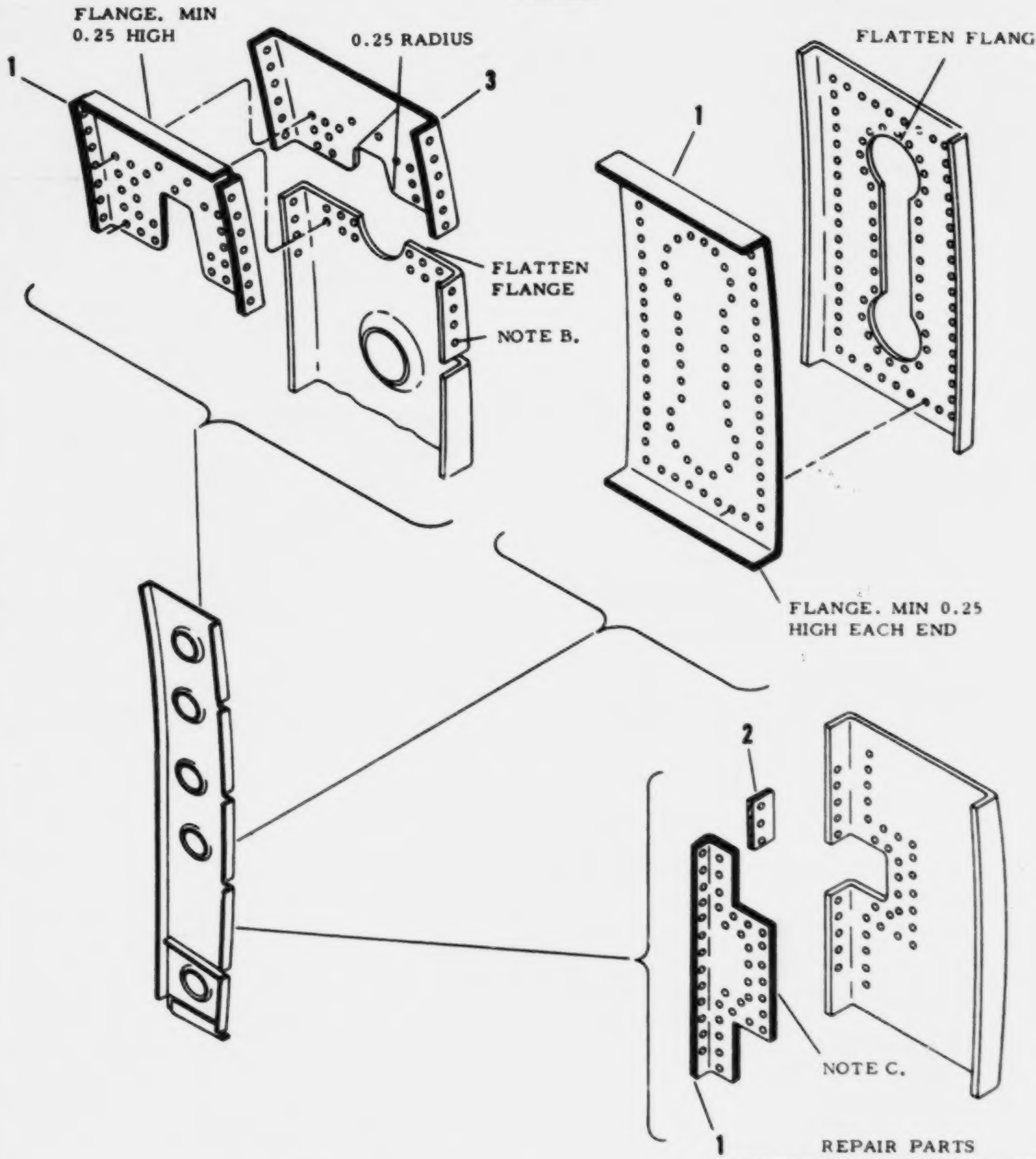
REPAIR PARTS

1. REINFORCEMENT. REFER TO APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS OR SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST

NOTES

A. ALL DIMENSIONS ARE IN INCHES

Figure 2-129.1. Formed parts repairs (Sheet 4 of 6)


FRAMES
FLANGE. MIN 0.25 HIGH
0.25 RADIUS
1
3
FLATTEN FLANGE
NOTE B.
1
FLATTEN FLANGE
FLANGE. MIN 0.25 HIGH EACH END
2
NOTE C.
1

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. USE ORIGINAL RIVET LOCATIONS AND SAME TYPE RIVET IN NEXT LARGER DIAMETER, OR SUBSTITUTE BLIND RIVETS IN ORIGINAL LOCATIONS
C. USE EXISTING RIVET LOCATIONS, A MINIMUM OF TWO ROWS IN EACH WEB, AND A MINIMUM OF FIVE RIVETS EACH SIDE OF DAMAGE IN FLANGE AREA

REPAIR PARTS

1. REINFORCEMENT. SEE APPLICABLE FIGURE FOR REPAIR MATERIAL AND THICKNESS OR SHEET 6 OF THIS FIGURE IF A SPECIFIC REPAIR FIGURE DOES NOT EXIST
2. FILLER. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL
3. REPLACEMENT. USE SAME MATERIAL AND THICKNESS AS ORIGINAL. SEE APPLICABLE FIGURE FOR ORIGINAL

Figure 2-129.1. Formed parts repairs (Sheet 5 of 6)

REINFORCEMENT SELECTION

ALUMINUM AND STEEL

ORIGINAL MATERIAL 2024-T4 OR 7075-T6	2024-T3 REINFORCEMENT FOR 2024-T4	2024-T3 REINFORCEMENT FOR 7075-T6	7075-T6 REINFORCEMENT FOR 7075-T6	4130 REINFORCEMENT FOR 2024-T4 OR 7075-T6
0.020	0.025	0.032	0.025	0.025
0.025	0.032	0.040	0.032	0.032
0.032	0.040	0.050	0.040	0.036
0.040	0.050	0.063	0.050	0.050
0.050	0.063	0.080	0.063	0.063
0.063	0.063	0.100	0.071	0.071
0.071	0.071	0.125	0.080	0.080
0.080	0.080	0.125	0.090	0.090
0.090	0.090	0.160	0.100	0.100
0.100	0.100	0.160	0.125	0.112
0.125	0.125	0.160	0.160	0.125

CORROSION RESISTANT STEEL

ORIGINAL MATERIAL	REINFORCEMENT*
301 ANL	301 ANL, 1/4H, 1/2H, 3/4H, H. 302 ANL. 17-7PH ANL, 180 KSI
301 1/4H	301 1/4H, 1/2H, 3/4H, H. 17-7PH ANL, 180KSI
301 1/2H	301 1/2H, 3/4H, H. 17-7PH 180KSI
301 3/4H	301 3/4H, H
301 H	301 H
302 ANL	301 1/4H, 1/2H, 3/4H, H. 302 ANL. 17-7PH ANL, 18KSI
17-7 ANL	17-7PH ANL, 180KSI
17-7 180KSI	17-7PH 180KSI

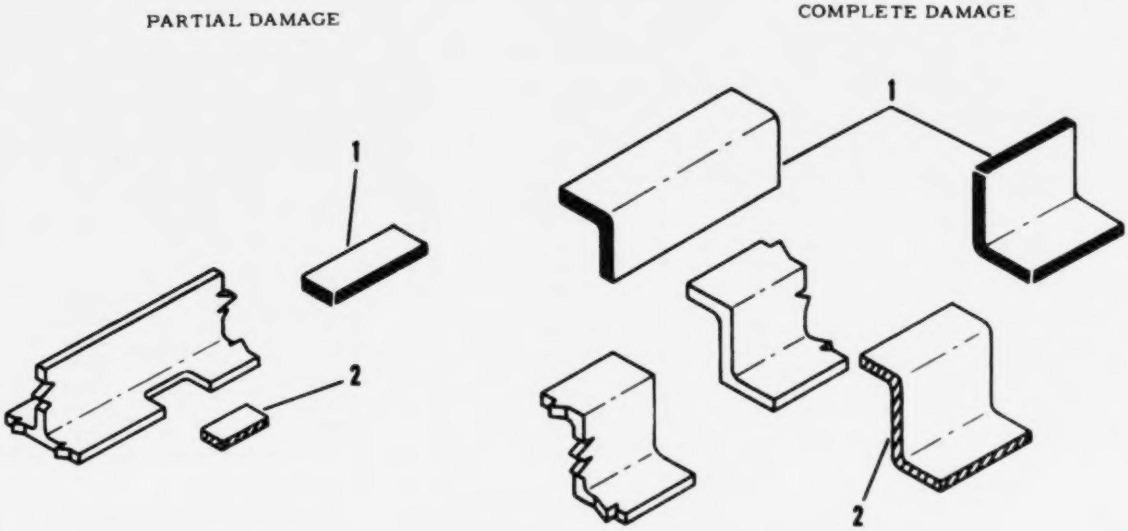
*REINFORCEMENT MATERIAL THICKNESS TO BE SAME AS ORIGINAL

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THIS CHART MAY BE USED TO SELECT A REINFORCEMENT, WHEN A SPECIFIC REPAIR FIGURE, DENOTING A SPECIFIC REPAIR MATERIAL, DOES NOT EXIST FOR A PARTICULAR PART

Figure 2-129.1. Formed parts repairs (Sheet 6 of 6)



REPAIR PARTS

1. REINFORCEMENT ANGLE OR PLATE. 4130 NORMALIZED. REFER TO A SPECIFIC REPAIR FIGURE IN THE APPLICABLE SECTION OF THIS MANUAL FOR THICKNESS. REFER TO NOTE D.
2. FILLER OR FORMED REPLACEMENT. 4130. SAME THICKNESS AS THAT PART OF THE ORIGINAL EXTRUSION IT REPLACES. REFER TO NOTE D.

SYMBOLS

*STEEL LOCKBOLTS 0.250 DIA (29666)
**DD TYPE RIVETS

NOTES

A. ALL DIMENSIONS ON ALL SHEETS ARE IN INCHES

B. THE REPAIR OF PARTIAL DAMAGE IS MADE USING THE SAME THICKNESS REPAIR PARTS AND THE SAME SIZE, TYPE, AND NUMBER OF ATTACHMENTS AS USED IN THE REPAIR OF COMPLETE DAMAGE

C. WHERE NO ORIGINAL FASTENERS EXISTED IN A GIVEN LEG, FLANGE OR WEB, IT IS PREFERRED, IF POSSIBLE, THAT FASTENERS IN THAT LEG, FLANGE OR WEB BE STAGGERED WITH RESPECT TO FASTENERS IN OTHER AREAS OF THE PART BEING REPAIRED

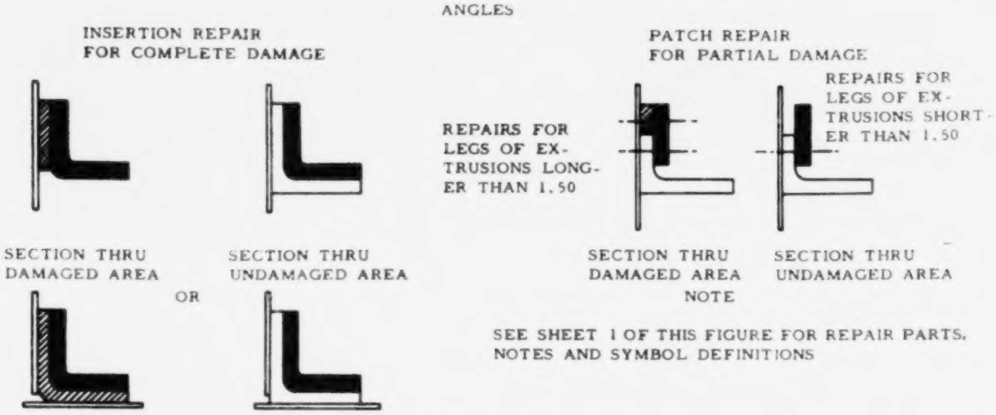
D. REPAIR PARTS CAN BE MADE FROM THE SAME MATERIAL AS THE PART BEING REPAIRED, PROVIDING THAT THE CONDITION OR TEMPER OF THE ORIGINAL MATERIAL IS ACHIEVED BEFORE ASSEMBLY

E. REFER TO TM55-1500-204-25/1, GENERAL AIRCRAFT MAINTENANCE FOR MINIMUM ALLOWABLE BEND RADII OF ANNEALED STEEL SHEET

F. ALL ATTACHMENTS ARE MS2047AD RIVETS UNLESS OTHERWISE NOTED

G. USE ORIGINAL RIVET LOCATIONS ON EACH SIDE OF THE DAMAGED AREA WHERE POSSIBLE, AND LOCATE AS MANY NEW ATTACHMENTS BETWEEN EXISTING ATTACHMENT LOCATIONS AS POSSIBLE.

Figure 2-129.2. Extruded parts repairs (Sheet 1 of 14)


ANGLES
INSERTION REPAIR FOR COMPLETE DAMAGE
PATCH REPAIR FOR PARTIAL DAMAGE
REPAIRS FOR LEGS OF EXTRUSIONS LONGER THAN 1.50
REPAIRS FOR LEGS OF EXTRUSIONS SHORTER THAN 1.50
SECTION THRU DAMAGED AREA
SECTION THRU UNDAMAGED AREA
OR
SECTION THRU DAMAGED AREA
SECTION THRU UNDAMAGED AREA

NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES AND SYMBOL DEFINITIONS

EXTRUSION DIE NO.	RIVETING INFORMATION					
	SHORT LEG			LONG LEG		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10133-0601	1	5	5	1	5	5
-0602	1	4	6**	1	4	6**
-0603	1	3	8*	1	3	8*
-0701	1	4	6**	1	4	6**
-1001	1	4	6**	1	4	6**
-1002	1	5	6**	1	5	6**
-1201	1	5	6**	1	5	6**
-1202	1	3	8*	1	3	8*
-1203	1	3	8*	1	3	8*
-1404	1	5	8*	1	5	8*
-2003	2	3	8*	2	3	8*
-3002	2	5	8*	2	5	8*
AND10134-0501	1	3	5	1	3	5
-0601	1	4	5	1	4	5
-0701	1	3	6**	1	3	6**
-0702	1	3	6**	1	3	6**
-1003	1	3	6**	1	3	6**
-1005	1	4	6**	1	4	6**
-1006	1	5	6**	1	5	6**
-1201	1	4	6**	1	4	6**
-1202	1	5	6**	1	5	6**
-1204	1	4	6**	1	4	6**
-1205	1	3	8*	1	3	8*
-1401	1	5	6**	2	4	6**
-1402	1	5	6**	2	5	6**
-1403	1	5	6**	2	4	6**
-1405	1	5	8*	1	5	8*
-1406	1	5	8*	1	5	8*
-1407	1	5	8*	1	5	8*
-1408	1	5	8*	1	5	8*
-1601	1	3	8*	1	3	8*
-1602	1	5	8*	1	5	8*
-1604	1	5	8*	1	5	8*
-2001	1	4	8*	1	4	8*
-2008	1	5	8*	2	3	8*
-2401	1	3	8*	2	3	8*
-2043	1	5	8*	2	4	8**

Figure 2-129.2. Extruded parts repairs (Sheet 2 of 14)

EXTRUSION DIE NO.	RIVETING INFORMATION					
	SHORT LEG			LONG LEG		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10134-2405	1	3	8*	2	3	8*
-2408	1	4	8*	2	4	8*
ALCOA 78J	1	4	6**	1	4	6**
734Q	3	5	8*	5	5	8*
5401	1	5	5	1	5	5
ALCOA 9484	1	5	6**	1	5	6**
9802	1	4	5	1	4	5
10854	1	4	5	1	4	5
11638	2	4	6**	2	4	6**
11820	1	4	6**	2	4	5
12983	1	4	5	1	4	5
13637	1	4	5	1	4	6**
13816	2	6	6**	3	6	6**
14202	2	5	6**	2	5	6**
15820	1	5	6**	1	5	6**
16869	1	5	6**	1	5	6**
16871	2	5	6**	2	4	6**
22477	1	5	4	1	5	4
22509	1	4	5	1	4	5
22526	1	5	5	1	5	5
22653	1	4	6**	1	4	6**
22878	1	3	6**	1	3	6**
22885	1	3	6**	1	3	6**
22892	1	5	6**	1	5	6**
22991	1	5	6**	1	5	6**
24761	1	3	8*	1	3	8*
27076	1	4	6**	1	4	6**
27778	1	5	6**	2	5	6**
28144	1	5	6**	2	5	6**
28546	1	4	5	1	4	5
29222	1	4	8*	1	4	8*
30022	1	3	6**	1	3	6**
30145	2	5	8*	3	4	8*
30201	1	4	8*	1	4	8*
30796	1	3	8*	1	3	8*
30934	1	3	6**	2	3	6**
31177	1	4	8*	1	4	8*
31683	1	3	8*	1	3	8*
31823	1	5	8*	2	5	8*
32155	1	4	8*	1	4	8*
32975	1	5	6**	1	5	6**
33811	1	5	8*	1	5	8*
43821	1	5	8*	1	5	8*
44076	1	4	5	1	4	5
45827	1	5	6**	1	5	6**
51406	1	5	6**	1	5	6**
51919	1	5	6**	1	5	6**
52735	1	3	6**	1	3	6**
56066	1	4	6**	1	4	6**
59148	1	5	8*	2	5	8*
59195	1	5	6**	2	3	6**
59409	1	3	6**	1	3	6**
59574	1	5	8*	1	5	8*

NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

Figure 2-129.2 Extruded parts repairs (Sheet 3 of 14)

EXTRUSION DIE NO.		RIVETING INFORMATION					
		SHORT LEG			LONG LEG		
		NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
ALCOA	59810	1	5	8*	2	3	8*
	60242	1	5	6**	2	4	6**
	60278	1	4	8*	1	4	8*
	60654	1	5	8*	1	5	8*
	60806	1	5	6**	1	5	6**
	60830	1	3	8*	1	3	8*
	61971	1	4	6**	1	4	6**
	62564	1	5	6**	1	5	6**
	66428	1	5	6**	1	5	6**
	67576	1	5	8*	1	5	8*
	67580	1	3	5	1	5	8*
	67987	1	3	8*	1	3	8*
	71369	1	4	6**	1	4	6**
	76983	1	5	8*	4	5	8*
	80759	1	3	8*	1	3	8*
	80788	2	4	8*	2	4	8*
HARVEY ALUMINUM	11301-3	1	6	6**	1	6	6**
	15078	1	5	5	1	5	5
	16119	1	6	6**	1	6	6**
	16264	1	4	8*	3	4	8*
	17335	1	3	8*	1	3	8*
	17413	1	4	8*	2	4	8*
	17716	1	5	6**	1	5	6**
	21741	1	4	8*	1	4	8*
REYNOLDS ALUMINUM	372	1	3	5	1	3	5
	4165	2	5	8*	2	5	8*
	5761	1	5	6**	2	3	6**
	6033	1	5	8*	1	5	8*
	7825	1	5	8*	1	5	8*
	8158	2	3	8*	3	3	8*
	8993	1	5	8*	1	5	8*
	19273	1	5	6**	1	6	6**
	19292	1	5	5	1	5	5
	26807	1	4	8*	1	4	8*
TEXAS ALUMINUM	T-2070	1	5	6**	1	6	6**
VERTOL STANDARD	90109	1	5	8*	2	5	8*
	90110	1	5	6**	2	5	6**
	90112	1	5	8*	1	5	8*
	90114	1	5	8*	1	5	8*
	90115	1	5	8*	1	5	8*
	90116	1	5	8*	1	5	8*
	90117	1	4	8*	1	4	8*
	90118	1	4	8*	1	4	8*
	90119	1	3	8*	1	3	8*
	BAC1503-1420	1	5	4	1	5	4
	-2731	1	4	6**	1	4	6**
	-100019	1	5	8*	1	5	8*
	-100037	1	5	6**	2	3	6**
	-100043	1	5	6**	2	4	6**
	BAC1514-157	1	3	8*	2	4	8**
	-539	1	3	8*	2	4	6**

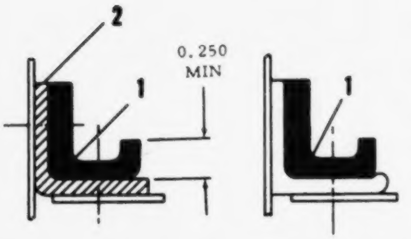
NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

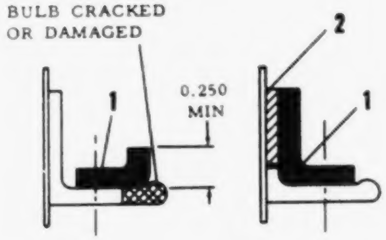
Figure 2-129.2. Extruded parts repairs (Sheet 4 of 14)

BULB ANGLES

INSERTION REPAIR
FOR COMPLETE DAMAGE


2
0.250
MIN
1
1
SECTION THRU
DAMAGED AREA
SECTION THRU
UNDAMAGED AREA

PATCH REPAIR
FOR PARTIAL DAMAGE


BULB CRACKED
OR DAMAGED
1
0.250
MIN
2
1
SECTION THRU
DAMAGED AREA

EXTRUSION DIE NO.	RIVETING INFORMATION					
	SHORT LEG			LONG LEG		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10135-1002	1	4	6**	1	4	6**
-1004	1	5	6**	1	5	6**
-1005	1	5	6**	1	5	6**
-1501	1	5	6**	2	5	6**
ALCOA 28172	1	4	6**	1	4	6**
83264	1	5	5	1	5	5

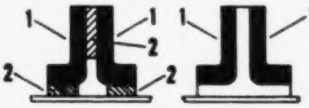
NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

Figure 2-129.2. Extruded parts repair (Sheet 5 of 14)

T-SECTIONS

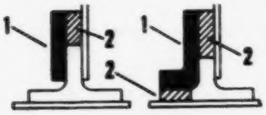
INSERTION REPAIR FOR COMPLETE DAMAGE



SECTION THRU DAMAGED AREA

SECTION THRU UNDAMAGED AREA

PATCH REPAIR FOR PARTIAL DAMAGE



SECTION THRU DAMAGED AREAS

EXTRUSION DIE NO.	RIVETING INFORMATION					
	WEB			EACH FLANGE		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10137-1301	1	4	5	1	4	5
-1304	1	4	6**	1	4	6**
-1401	1	4	6**	1	5	6**
-1405	1	4	6**	1	4	6**
-1406	1	5	6**	1	5	6**
-1501	1	3	8*	1	3	8*
-1601	1	5	6**	1	5	6**
-1603	1	5	6**	1	5	6**
-1605	1	3	8*	1	3	8*
2001	1	5	8*	1	5	8*
-2002	1	5	8*	1	5	8*
-2004	1	5	8*	1	5	8*
-2006	1	5	8*	1	5	8*
-2008	1	3	8*	1	3	8*
-2403	1	3	8*	1	3	8*
-2405	2	3	8*	1	5	8*
-2406	2	3	8*	1	5	8*
-2407	2	3	8*	1	5	8*
-3001	1	5	8*	2	3	8*
-3005	2	3	8*	2	3	8*
ALCOA 12756	1	5	8*	1	5	8*
13872	1	3	8*	1	3	8*
22008	1	5	6**	1	5	6**
22981	1	4	5	1	5	5
23160	1	5	6**	1	5	6**
27622	1	5	8*	1	5	8*
27695	1	3	6**	1	3	6**
29075	1	4	8*	1	3	8*
30670	1	5	6**	1	5	6**
30674	1	5	5	1	5	5
31543	1	3	8*	1	3	8*
31901	2	5	6**	1	5	6**
32220	1	3	6**	1	3	6**
33185	1	3	8*	1	3	8*
33495	2	4	6**	1	5	6**
37289	2	3	8*	1	5	8*
43774	1	3	8*	1	3	8*
44132	1	5	8*	2	3	8*
49225	1	5	6**	1	5	6*
51670	3	5	8*	1	5	8*
51994	2	5	8*	1	5	8*
52057	1	5	8*	1	4	6**
52233	2	5	8*	1	5	8*
52361	2	3	8*	1	5	8*
52515	2	4	8*	1	4	8*
52466	3	4	6**	1	5	6**
52985	2	5	8*	1	5	8*
52986	1	5	8*	1	4	8*

NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

Figure 2-129.2. Extruded parts repairs (Sheet 6 of 14)

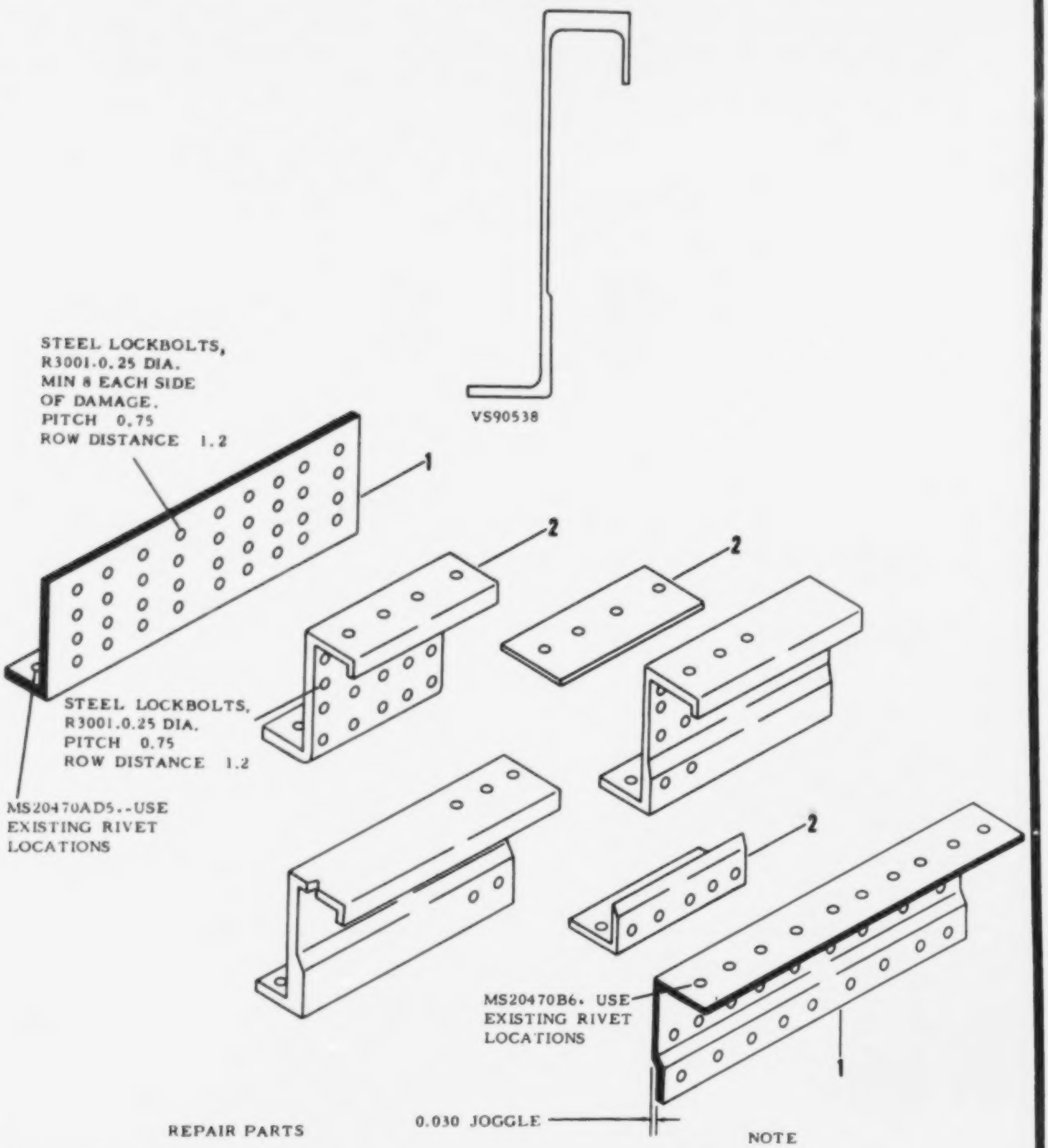
EXTRUSION DIE NO.	RIVETING INFORMATION					
	WEB			EACH FLANGE		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
ALCOA 55794	2	4	6**	1	5	6**
59331	2	4	8*	1	4	8*
59337	2	5	8*	1	5	8*
62409	1	4	8*	1	3	8*
66017	1	4	8*	1	3	8*
66211	2	4	8*	1	5	8*
66517	1	5	6**	2	5	6**
69464	1	3	8*	1	3	8*
76062	3	5	8*	1	5	8*
76959	1	4	8*	1	4	8*
HARVEY ALUMINUM 15152	1	5	6**	1	5	6**
REYNOLDS ALUMINUM 11416	1	4	6**	1	4	6*
11730	2	4	6**	1	5	8*
16908	2	4	6**	1	5	8*
18637	2	5	8*	1	5	8*
22769	2	4	8*	1	4	8*
6447	2	5	8*	1	5	8*
9097	2	3	8*	1	5	8*
VERTOL STANDARDS 90302	1	5	8*	1	5	8*
90303	2	3	8*	1	5	8*
90304	1	4	8*	1	4	8*
90305	1	5	6**	1	6	6**
90306	1	4	8*	1	4	8*
90307	2	3	8*	1	5	8*
90308	1	5	8*	1	5	8*
90309	1	5	8*	1	5	8*
90310	1	5	8*	1	5	8*
90311	2	3	8*	1	5	8*
90312	1	4	8*	1	4	8*
90313	1	5	8*	1	5	8*
90314	2	3	8*	2	3	8*
90315	1	5	6**	1	5	6**
90316	1	5	8*	1	5	8*
90317	1	3	8*	1	3	8*
90318	3	5	8*	1	5	8*
90321	1	4	5	1	4	5

NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

Figure 2-129.2. Extruded parts repairs (Sheet 7 of 14)

SPECIAL ZEE SECTIONS


VS90538
STEEL LOCKBOLTS, R3001.0.25 DIA. MIN 8 EACH SIDE OF DAMAGE. PITCH 0.75 ROW DISTANCE 1.2
1
2
2
STEEL LOCKBOLTS, R3001.0.25 DIA. PITCH 0.75 ROW DISTANCE 1.2
MS20470AD5.-USE EXISTING RIVET LOCATIONS
2
MS20470B6. USE EXISTING RIVET LOCATIONS
1
0.030 JOGGLE

REPAIR PARTS

1. REINFORCEMENT. 0.090 4130
2. REPLACEMENT.

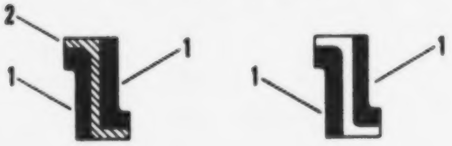
NOTE

ALL DIMENSIONS ARE IN INCHES

Figure 2-129.2. Extruded parts repairs (Sheet 8 of 14)

Z-SECTIONS

INSERTION REPAIR
FOR COMPLETE DAMAGE



SECTION THRU
DAMAGED AREA

SECTION THRU
UNDAMAGED AREA

EXTRUSION DIE NO.	RIVETING INFORMATION					
	WEB			EACH LEG		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10138-0403	1	4	5	1	4	5
-1004	1	4	6**	1	4	6**
-1005	1	4	6**	1	4	6**
-1009	1	4	6**	1	4	6**
AND10139-0505	1	4	6**	1	4	6**
-0707	1	4	6**	1	4	6**
-1106	1	4	6**	1	4	6**
ALCOA 59675	1	4	5	1	4	5
85491	2	4	8*	1	5	8*
REYNOLDS ALUMINUM 10270	1	3	8*	1	3	8*
VERTOL STANDARDS 90601	2	4	6**	1	4	6**
90602	1	4	6**	1	4	6**
90603	2	4	8*	1	4	8*
90604	2	4	6**	1	4	6**

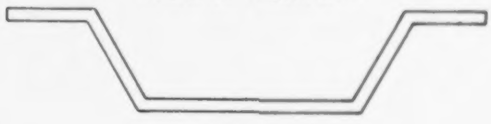
NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

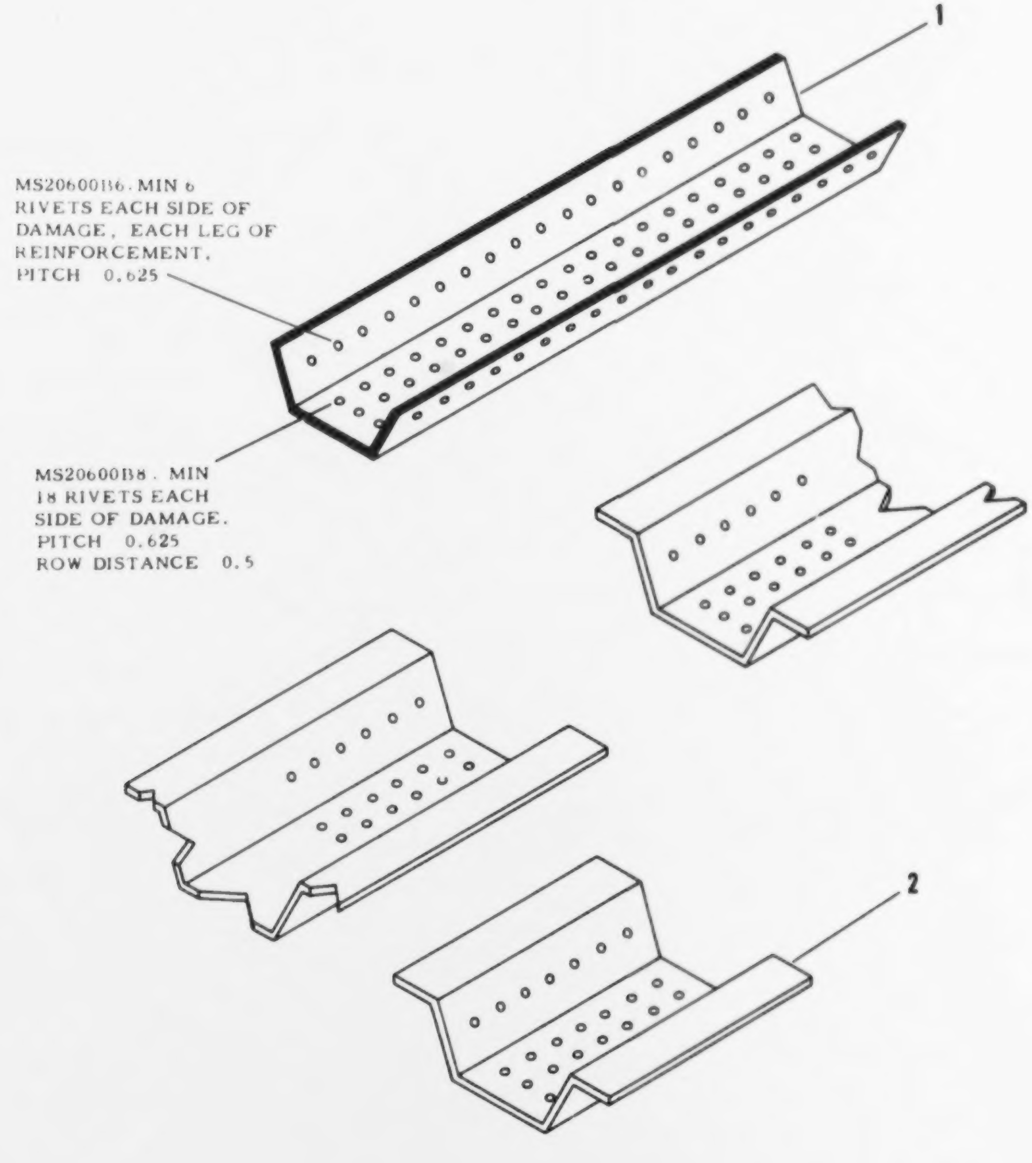
AV 103615
B114-64-355

Figure 2-129.2. Extruded parts repairs (Sheet 9 of 14)

SPECIAL CHANNELS



VS90575



MS20600B6. MIN 6 RIVETS EACH SIDE OF DAMAGE, EACH LEG OF REINFORCEMENT, PITCH 0.625

MS20600B8. MIN 18 RIVETS EACH SIDE OF DAMAGE. PITCH 0.625 ROW DISTANCE 0.5

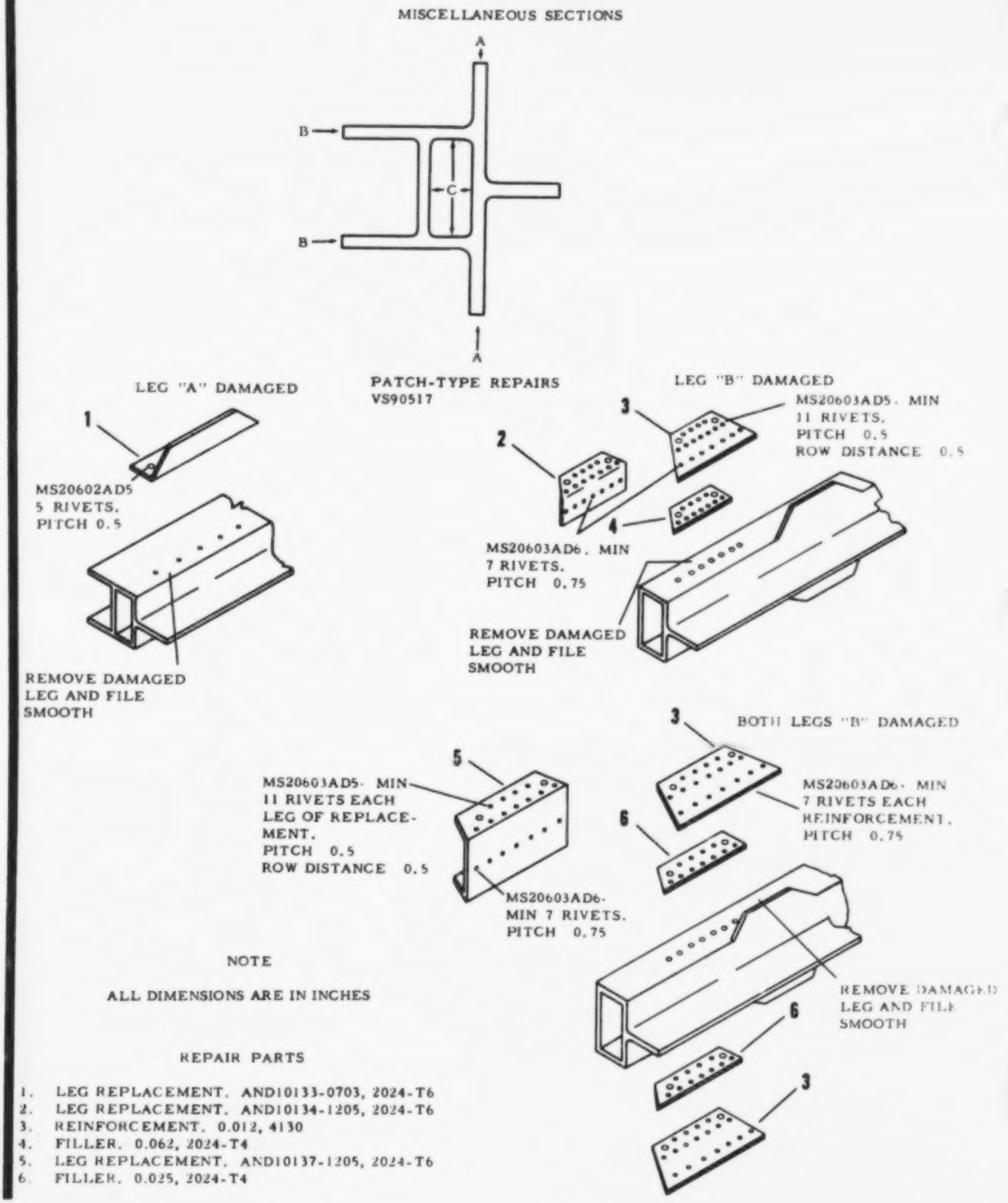
REPAIR PARTS

1. REINFORCEMENT. 0.090, 7075-T6
2. REPLACEMENT. VS90575, ZK60A-T5

NOTE

ALL DIMENSIONS ARE IN INCHES

Figure 2-129.2. Extruded parts repairs (Sheet 10 of 14)


MISCELLANEOUS SECTIONS
A
B
C
B
A
LEG "A" DAMAGED
1
MS20602AD5
5 RIVETS.
PITCH 0.5
REMOVE DAMAGED
LEG AND FILE
SMOOTH
PATCH-TYPE REPAIRS
VS90517
LEG "B" DAMAGED
3
MS20603AD5. MIN
11 RIVETS.
PITCH 0.5
ROW DISTANCE 0.5
2
4
MS20603AD6. MIN
7 RIVETS.
PITCH 0.75
REMOVE DAMAGED
LEG AND FILE
SMOOTH
3
BOTH LEGS "B" DAMAGED
5
MS20603AD5. MIN
11 RIVETS EACH
LEG OF REPLACE-
MENT.
PITCH 0.5
ROW DISTANCE 0.5
MS20603AD6.
MIN 7 RIVETS.
PITCH 0.75
MS20603AD6. MIN
7 RIVETS EACH
REINFORCEMENT.
PITCH 0.75
6
REMOVE DAMAGED
LEG AND FILE
SMOOTH
6
3

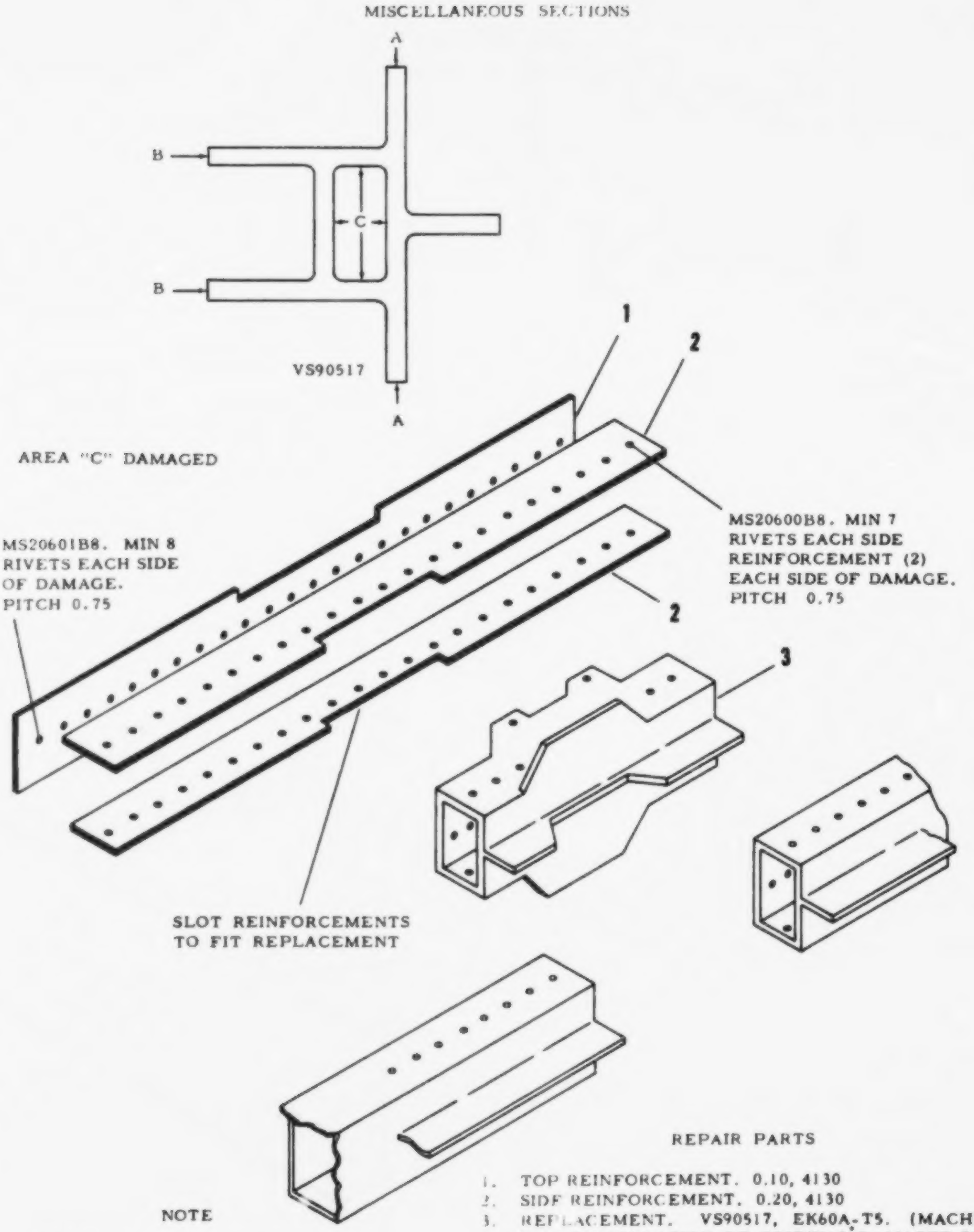
NOTE

ALL DIMENSIONS ARE IN INCHES

REPAIR PARTS

1. LEG REPLACEMENT. AND10133-0703, 2024-T6
2. LEG REPLACEMENT. AND10134-1205, 2024-T6
3. REINFORCEMENT. 0.012, 4130
4. FILLER. 0.062, 2024-T4
5. LEG REPLACEMENT. AND10137-1205, 2024-T6
6. FILLER. 0.025, 2024-T4

2-129.2. Extruded parts repairs (Sheet 11 of 14)


MISCELLANEOUS SECTIONS
A
B
C
B
VS90517
A
1
2
AREA "C" DAMAGED
MS20601B8. MIN 8 RIVETS EACH SIDE OF DAMAGE. PITCH 0.75
MS20600B8. MIN 7 RIVETS EACH SIDE REINFORCEMENT (2) EACH SIDE OF DAMAGE. PITCH 0.75
2
3
SLOT REINFORCEMENTS TO FIT REPLACEMENT

REPAIR PARTS

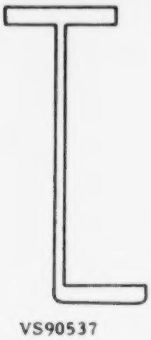
1. TOP REINFORCEMENT. 0.10, 4130
2. SIDE REINFORCEMENT. 0.20, 4130
3. REPLACEMENT. VS90517, EK60A-T5. (MACHINE TO CONFIGURATION OF ORIGINAL DAMAGED SECTION)

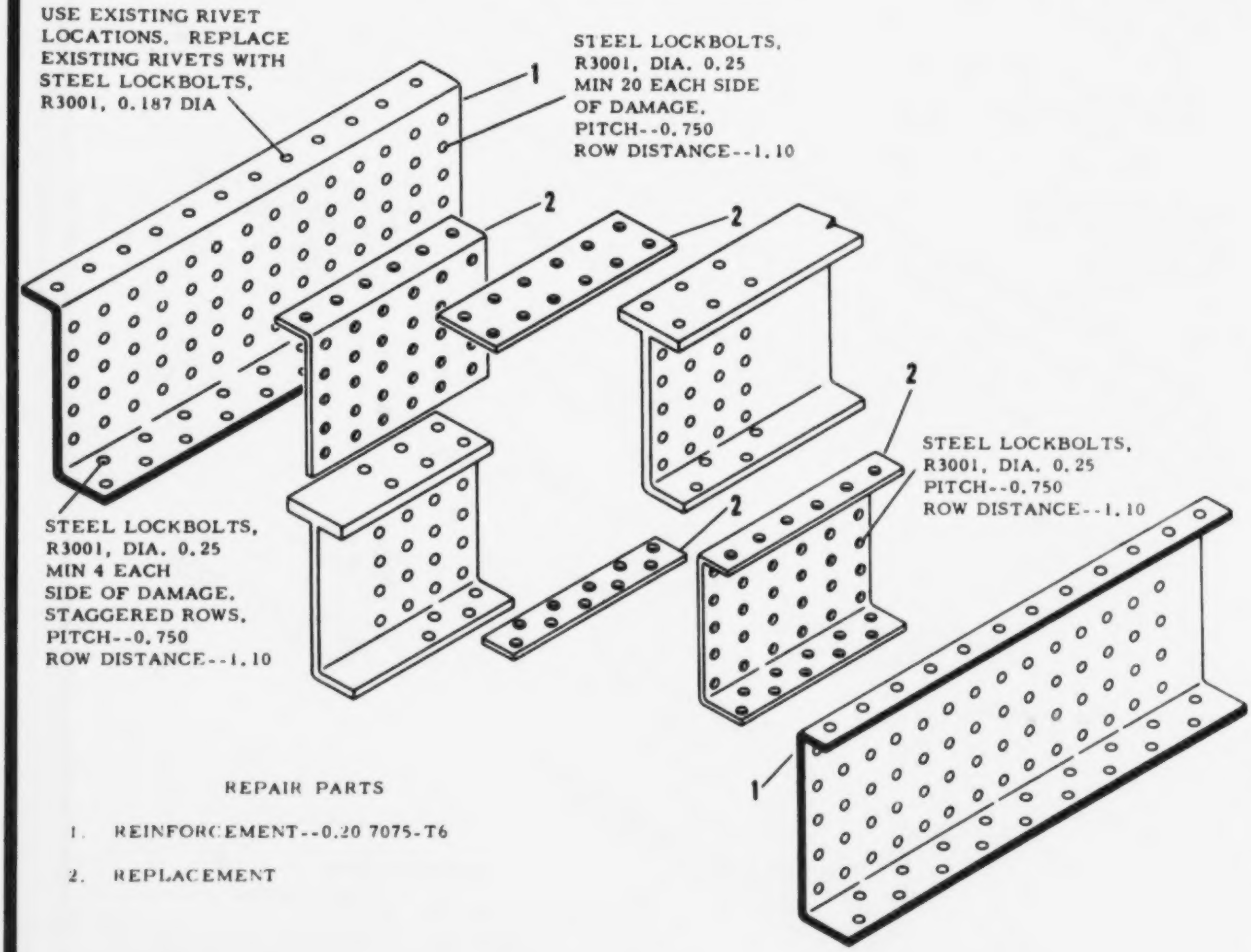
NOTE

ALL DIMENSIONS ARE IN INCHES

Figure 2-129.2. Extruded parts repairs (Sheet 12 of 14)

SPECIAL TEE SECTIONS




USE EXISTING RIVET LOCATIONS. REPLACE EXISTING RIVETS WITH STEEL LOCKBOLTS, R3001, 0.187 DIA
1
STEEL LOCKBOLTS, R3001, DIA. 0.25 MIN 20 EACH SIDE OF DAMAGE. PITCH--0.750 ROW DISTANCE--1.10
2
2
2
2
STEEL LOCKBOLTS, R3001, DIA. 0.25 PITCH--0.750 ROW DISTANCE--1.10
STEEL LOCKBOLTS, R3001, DIA. 0.25 MIN 4 EACH SIDE OF DAMAGE. STAGGERED ROWS, PITCH--0.750 ROW DISTANCE--1.10
2
1

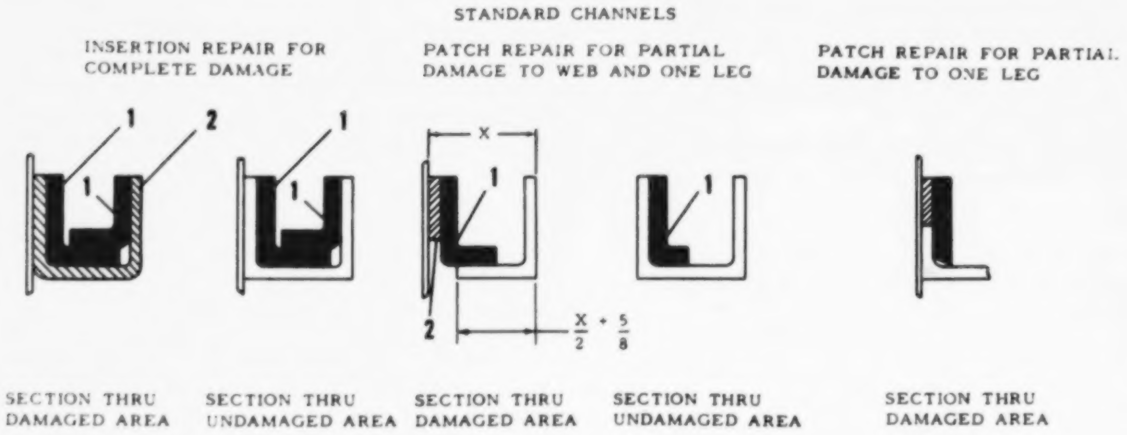
REPAIR PARTS

1. REINFORCEMENT--0.20 7075-T6
2. REPLACEMENT

NOTE

ALL DIMENSIONS ARE IN INCHES

Figure 2-129.2. Extruded parts repairs (Sheet 13 of 14)


STANDARD CHANNELS
INSERTION REPAIR FOR COMPLETE DAMAGE
PATCH REPAIR FOR PARTIAL DAMAGE TO WEB AND ONE LEG
PATCH REPAIR FOR PARTIAL DAMAGE TO ONE LEG
1
2
1
1
1
X
1
1
2
X/2 + 5/8
1
SECTION THRU DAMAGED AREA
SECTION THRU UNDAMAGED AREA
SECTION THRU DAMAGED AREA
SECTION THRU UNDAMAGED AREA
SECTION THRU DAMAGED AREA

EXTRUSION DIE NO.	RIVETING INFORMATION					
	WEB			EACH LEG		
	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS	NO. ROWS EACH SIDE OF DAMAGE	MIN NO. PER ROW	DIA 32NDS
AND10137-0707	1	3	6**	1	3	6**
-1005	1	3	6**	1	3	6**
-1405	2	5	6**	1	5	6**
-1406	1	3	8*	1	3	8*
-1612	2	4	8*	1	4	8*
-2009	1	3	8*	1	3	8*
-2404	1	3	8*	1	3	8*
-2405	1	4	8*	1	4	8*
-2601	1	3	8*	1	3	8*
NAS345- 126	1	4	8*	1	4	8*
- 134	3	3	8*	2	6	8*
ALCOA 2129	1	5	5	1	5	5
56914	1	5	5	1	5	5
59256	2	5	5	1	5	5
60414	1	4	8*	1	4	8*
VERTOL STANDARD 90408	3	3	8*	2	4	8*

NOTE

SEE SHEET 1 OF THIS FIGURE FOR REPAIR PARTS, NOTES, AND SYMBOL DEFINITIONS

AV 103816
B114-69-355H

Figure 2-129.2. Extruded parts repairs (Sheet 14 of 14)

2-643. Repair.

Loose skins, skins having unacceptable oilcans, and trapped skin should be repaired as directed in subsequent paragraphs. Repairs to the body skin below waterline 0 must be sealed watertight. Refer to para 2-554.

2-644. Trapped Skin Repair (AVIM). Trapped skin, evidenced by an outward or inward bulge between attaching hardware and caused by improper repair techniques, is not acceptable. Correct this condition by removing attaching hardware, as required, allowing skin to shift, and installing next larger size fasteners.

2-645. Loose Skin and Unacceptable Oilcan Repair (AVIM). Loose skins and skins having unacceptable oilcan should be repaired using stiffeners with the following exceptions:

a. Stiffeners are not permitted within area on bottom of cabin fuselage section between lower longerons and sta 160 and 482.

b. Stiffeners are not permitted externally on the helicopter.

c. Stiffeners are not permitted in areas where they will interfere with installation and function or operation of any component.

d. Determine locations where a minimum number of stiffeners will correct oilcanning or loose skin. Add stiffeners as required. Stiffeners must be attached at each end to primary structure, such as longeron to longeron or frame to frame. The method of attachment should eliminate discrepancy without transferring it to another area. Comply with following methods:

(1) Stiffeners must be next heavier thickness than skin to which they are attached and are to be formed from 2024-T3 clad aluminum alloy. Stiffeners exceeding 30 inches in length must be made from Alcoa 33372 or equivalent extrusions.

(2) If attaching clips are used, make them from 2024-T3 clad aluminum alloy. They must be same thickness as stiffener to which they are attached.

(3) Install rivets MS20470AD4 at approximately ¾-inch pitch for attachment of stiffeners, not thicker than 0.040 inch.

2-646. Skin and Web Repairs.

(See fig. 2-7.) Paragraphs 2-647 thru 2-652 contain procedures and limitations for coin patch repair for skins, backing plate repair for skins, backing plate repair for webs, and temporary patch repairs for skin. (See fig. 2-127 for rivet type and spacing.) Maintain a minimum clearance of ⅛ inch between cutouts and edge of replacements, unless otherwise noted. Insulate dissimilar metals. Refer to para 2-619.

2-647. Coin Patch Repair For Skins.

This repair is for dents, punctures, tears, and small cracks that can be cut out from ½ inch to 1½-inch diameter. No more than two patches are permitted for each skin panel. Panels, not less than 15 by 50 inches, between longer logerons and sta 160 and 482, may contain a maximum of four patches. All patches must clear adjacent structural members by ⅛ inch and be sealed. Refer to para 2-554 for information on watertightness sealing.

2-648. Repair.

a. Cut out damage and make a coin patch of same material and thickness as skin. The patch should have a diameter ⁵⁄₁₆ inch less than cutout.

b. Make a circular backing plate three times diameter of coin patch and from same material but in next heavier thickness.

c. Smooth edges of cutout, coin patch, and backing plate with a file.

d. Center coin patch on backing plate and drill rivet holes through coin patch and backing plate.

NOTE

The size and number of rivet holes are determined by size of rivet to be used. In most cases rivets MS20470AD3 can be used. See fig. 2-127 for information on rivet selection.

e.Install and set rivets.

f. Spray or brush a thin coat of primer (C259) on all surfaces of coin patch. Allow primer to dry.

g. Insert coin patch in cutout from inside skin. Drill rivet holes through backing plate and skin.

NOTE

Use rivets MS20470AD4, for 0.025-inch thick skin, and rivets MS20470AD5, for skin 0.03 inch or thicker. Rivet pitch should be approximately ¾ inch.

h. Remove coin patch from cutout after establishing a rivet pattern and seal faying surfaces of cutout and coin patch. Refer to para 2-544.

i. If damage is less than ½ inch and larger than ³⁄₁₆ inch and located over an undamaged frame or stiffener, repair damage by omitting backing plate. Rivet coin patch to frame or stiffener.

j. Install and set rivets.

NOTE

Repair magnesium skin as directed in preceding steps, providing dissimilar metals are insulated. Refer to para 2-619. Use rivets MS20470B.

2-649. Backing Plate Repair For Webs.

This repair is intended for damage occurring in webs, such as holes, tears or sharp dents that can be cutout. It must be repaired within an area not to exceed 1½-inch diameter. When repaired, it must clear adjacent structure by ⅛ inch. Not more than two repairs are permitted in any web.

2-650. Repair.

a. Remove damage by cutting or drilling. The diameter of cutout should not be less than ³⁄₁₆ inch.

b. Smooth edges of cutout with a file.

c. If damage can be removed by drilling, drill a ³⁄₁₆-inch-diameter hole or smaller. Insert a rivet MS20470AD and install a washer AN960D of a size to fit shank of rivet. Set rivet.

d. If diameter of cutout is larger than ³⁄₁₆ inch, make a circular backing plate from same material as web, in next heavier thickness.

NOTE

The backing plate must be large enough to cover cutout and overlap web a minimum of four times diameter of rivet. If backing plate cannot be circular, all corners must have a minimum radius of ¼ inch.

e. Smooth edges of backing plate with a file.

f. Center backing plate over cutout. Drill a rivet pattern having a pitch of ½ to ¾ inch. The number of rivet holes will be determined by size of backing plate. Maintain a pattern that will allow a minimum edge distance of two-times diameter of rivet. Use rivets MS20470AD4 for webs not thicker than 0.025 inch. Use rivets MS20470AD5 for webs 0.03 inch or thicker. Use monel rivets for corrosion-resistant steel webs. See fig. 2-127 for information on rivet selection.

g. Apply a thin even coat of primer (C259) to faying surfaces of backing plate and web. Allow primer to dry.

h. Assemble backing plate to web by installing and setting rivets.

2-651. *Temporary Patch Repairs For Skins.*

(See fig. 2-7.) Holes or cracks in skin panels within negligible limits applicable to area can be repaired temporarily using fabric or tape patches. Damage considered allowable for one-time flights can also be repaired by this method. The repaired area should not be painted so it can be easily detected for permanent repair.

2-652. *Repair.*

a. Repair holes and cracks with fabric patches as follows:

(1) Stop-drill cracks or trim hole. Smooth edges of hole with a file.

(2) Remove paint from area surrounding damage using acetone (C9) or thinner (C357).

(3) Cut a pinked-edge patch from cloth (C105).

(4) Apply a coat of dope (C135) to area surrounding damage.

(5) Apply patch while dope is wet. Smooth patch to remove all wrinkles.

(6) Remove excess dope and allow patch to dry.

(7) Apply two additional coats of dope to patch. Allow sufficient drying time between coats.

b. Repair holes and cracks with tape patches as follows:

(1) Repeat steps a.(1) and (2) as required.

(2) Cut an oval or round patch from tape (C340).

(3) Apply patch to damaged area using a rubber roller, while exerting pressure, particularly around edges of patch.

2-653. Miscellaneous Typical Repairs.

Refer to TM 55-1500-204-25/1 for repair information on attachment holes, gap elimination and leveling of installation, and spotwelded assembly repairs.

2-654. *Canvas and Webbing Repair.*

Repair canvas and webbing as shown in fig. 2-42.

2-655. *Aluminum Tubing Repairs.*

Repair aluminum tubing as shown in fig. 2-18.

2-656. *Rubber Seal Repair.*

Repair damaged seals using variations of illustrated repair. (See fig. 2-130.) The type of cement required depends on the composition of the seal material. Damage to seals, consisting of one or more integral parts, such as retainers or cloth covers, is usually impractical to repair. In most cases the seal should be replaced.

2-657. *Hinge Repairs.*

Repair hinges by removing damaged segments or barrels. (See fig. 2-131.) Determine maximum allowable damage prior to beginning repair. Refer to table 2-25. Replace entire hinge assembly if damage exceeds maximum allowable.

Table 2-25. Hinge Repairs

HINGE PART NO.	NOMENCLATURE	MATERIAL	TYPE OF INSTALLATION AND REPAIR (SEE NOTES)
114S3607-79	Leaf-butt hinge-drip tray-aft xmsn	MS20001	A
114S2609-11	Hinge, assy-step-cabin-side	MS20001	F
114S1632-21	Leaf, butt hinge-door access-nose	MS20001PH4	A
114S1901-81	Hinge, fairing-fwd pylon	MS20001PH6	B
114S5901-71	Leaf, butt hinge-fwd 1. gr pod sta 245	MS20001PH6	A
114S6107-43	Hinge, ramp sta 98.955	MS20001PH9	A
114S5910-35	Hinge, half-fairing assy-aft 1. gr pod	MS20001PH10	C
114S6701-31	Leaf, butt hinge-aft 1. gr pod	MS20001PX12	C
114S6701-32	Leaf, butt hinge-former-ramp sta 98.955	MS20001PX12	C
114S6701-33	Leaf-butt hinge-former-ramp sta 98.955	MS20001PX14	C
114S2905-313	Hinge-tunnel cover	MS20257-4-6.50	C
114S3904-19	Hinge, door access	VS20101-1-2	C
114S3903-15	Leaf-butt hinge-access door-xmsn	VS20101-1-2	C
114S3903-17	Leaf, butt hinge-access door-xmsn	VS20101-1-2	C
114S5907-65	Leaf, butt hinge-aft 1. gr pod-sta 482	VS20101-1-2	C
114S5907-63	Hinge, half-aft 1. gr. pod-sta 482	VS20101-1-2	C
114S3904-17	Hinge, door-access-sta 482-534	VS20101-1-2	C
114S3905-35	Hinge, half-access door-hyd. test	VS20101-1-4	G

Table 2-25. Hinge Repairs — Continued

HINGE PART NO.	NOMENCLATURE	MATERIAL	TYPE OF INSTALLATION AND REPAIR (SEE NOTES)
114S1853-15	Hinge, assy-upper-cabin door	VS60904	D
114S1853-17	Hinge, assy-upper-cabin door	VS60904	C
114S2850-1	Hinge, assy-elect. pod compartment	VS60904	D
114S2506-69	Hinge, structural-bottom cabin-sta 180-440	VS90522	E
114S6604-21	Hinge, pad-cargo loading ramp-aux	VS90565-2014T6	E
114P8012-1	Hinge, half-cowl-eng	AL ALY 356T6	D
114P8013-2	Hinge, half-cowl-eng	AL ALY 356T6	D
114P8011-5	Leaf-assy-access cover-eng	AL ALY 2024-T4	D
114P8011-6	Leaf, assy-access cover-eng	AL ALY 2024-T4	D
114P8013-10	Leaf, assy-access cover	MIL-T-9046 Class II casting	D
114P8014-10	Hinge, half-cowl	Invest casting	D
114P8014-9	Hinge, half-cowl	SST casting 17-4PH	D
114S2610-35	Hinge, half-cowl	MS20001PY4-400	C
114S3615-9	Hinge, panel assy-apu	MS20001PY4	C
114S5612-12	Hinge, step-foldout-pod	MS00001H8-940	A
114S5612-19	Hinge, step-foldout-pod	MS00001H8-940	A
114S5901-65	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-66	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-72	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-115	Hinge, access panel inst.-fwd 1. gr sta 245	MS20001PH6	A
114S5901-121	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-128	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-129	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-130	Hinge, access panel inst.-fwd 1. gr-sta 245	MS20001PH6	A
114S5901-131	Hinge, access panel inst.-fwd 1. gr	MS20001PH6	A
114S5902-19	Hinge, pnl. instr. ext pwr recep-sta 160-180	VS20101-2-2	C
114S5902-21	Hinge, pnl. instr. ext power recep	VS20101-2-2	C
114S5931-43	Hinge, access pnl, instl. pod-sta 438.51-46	VS90528X18-7-7075T6	A
114S5931-44	Hinge, access pnl, instl. pod	VS90528X18-7-7075T6	A
114S6710-2	Hinge, cargo loading ramp aux	VS20102-1	B
114S6710..3	Hinge, cargo loading ramp aux	VS20103-3	B
114S1632-33	Hinge, door assy-nose compartment	VS90527	B
114S4901-39	Hinge, leading edge fairing assembly	MS20001PH6	B
114S4901-40	Hinge, leading edge fairing assembly	MS20001PH6	B
114S4101-37	Hinge, aft pylon former station 482.00	MS2001PH6	B
114S4101-38	Hinge, aft pylon former station 482.00	MS2001PH6	B

NOTES

DAMAGE CRITERIA — ALLOWABLE CONDITIONS:

A. Type A installation. (See fig. 2-131.)
  1. End of hinge may have two barrels failed provided:
    a. The next two barrels are undamaged.
    b. Each undamaged segment has at least two attachment rivets on each side of the hinge.
  2. Any four consecutive inner barrels (away from hinge end) may be failed provided:
    a. Two adjacent barrels on each end of the failed section are undamaged.
    b. Each undamaged segment has at least two attachment rivets on each side.

B. Type B Installation. (See fig. 2-131.)
  1. Each end must have two undamaged barrels with two attachment rivets on each side.
  2. Any four consecutive inner barrels (away from hinge end) may be failed provided:
    a. Two adjacent barrels on each end of the failed section are undamaged.
    b. Each undamaged segment has at least two attachment rivets on each side.

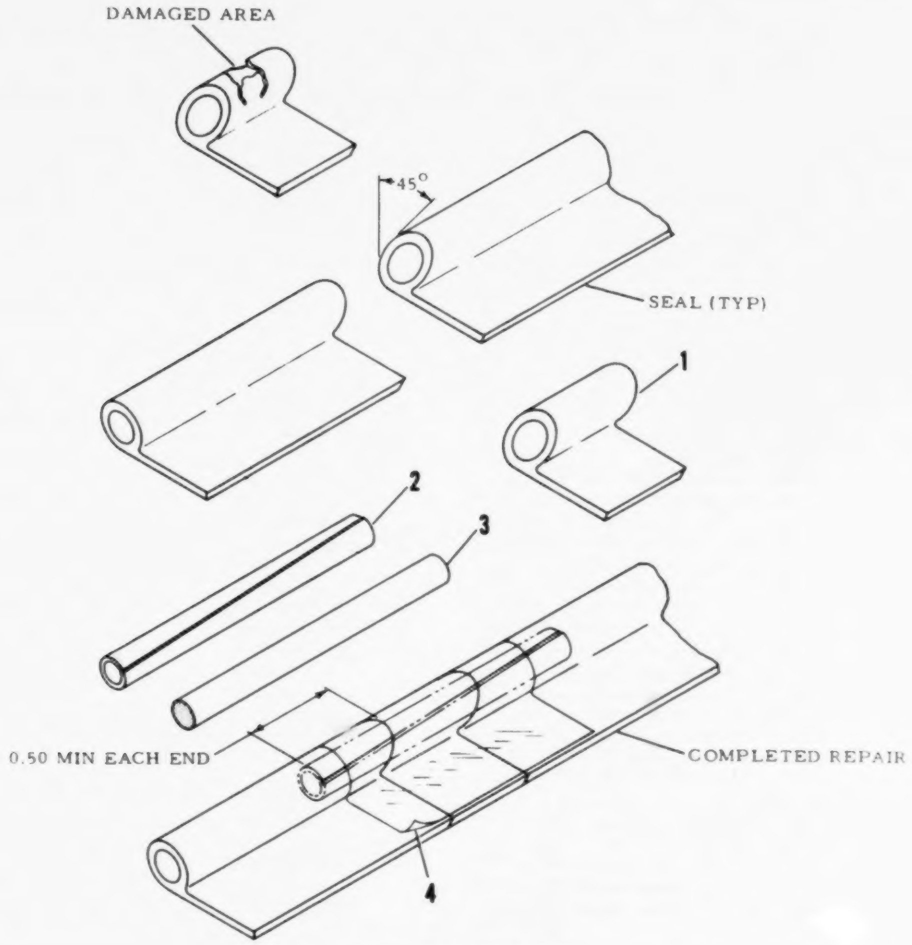
C. Type C installation. Non-continuous hinge. Replace hinge if either end has one full failed barrel.

D. Type D installation. Single connection hinge. Replace if failed.

E. Type E installation. Stress critical. Replace if any barrel has failed.

F. Type F installation — Spring type. Replace if more than two end barrels or one barrel adjacent to spring has failed.

G. Type G installation — Multiple section continuous hinge. Replace if more than one whole section of barrels is failed.



REPAIR PARTS

1. INSERT. SECTION OF ORIGINAL TYPE SEAL
2. SPLICE. RUBBER SHEET OF SAME COMPOSITION AS SEAL, TUBE MAY BE SUBSTITUTED IF OF PROPER DIAMETER OR SPLIT TO FIT
3. SPLICE ALTERNATE. SPONGE RUBBER OF SAME COMPOSITION AS SEAL, TO BE USED ONLY WHEN NO OTHER MATERIAL IS AVAILABLE
4. FILM. CLEAR PLASTIC TO RESTORE MOISTURE PROTECTION ON SPONGE SEALS WITH FACINGS

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. PEEL DAMAGED AREA FROM STRUCTURE. NEST SECTION OF ORIGINAL TYPE SEAL WITH DAMAGED AREA. CUT OUT DAMAGED AREA AND THROUGH SECTION OF ORIGINAL MATERIAL ON A 45° ANGLE TO OBTAIN MAXIMUM FAYING SURFACE
C. INSTALL A SPLICE, AND CENTER AS SHOWN. ALL FAYING SURFACES TO BE COATED WITH THE APPLICABLE ADHESIVE. REFER TO PARA 2-536 FOR INFORMATION ON ADHESIVE BONDING. REPAIR SHOWN IS APPLICABLE TO HOLLOW SEALS ONLY
D. SEALS SHOWN ON SUBSEQUENT SHEETS, WITHOUT A MATERIAL SYMBOL, ARE MADE OF SILICONE RUBBER

42x51

B114-54-345V

Figure 2-130. Rubber Seal Repairs (Sheet 1 of 4)

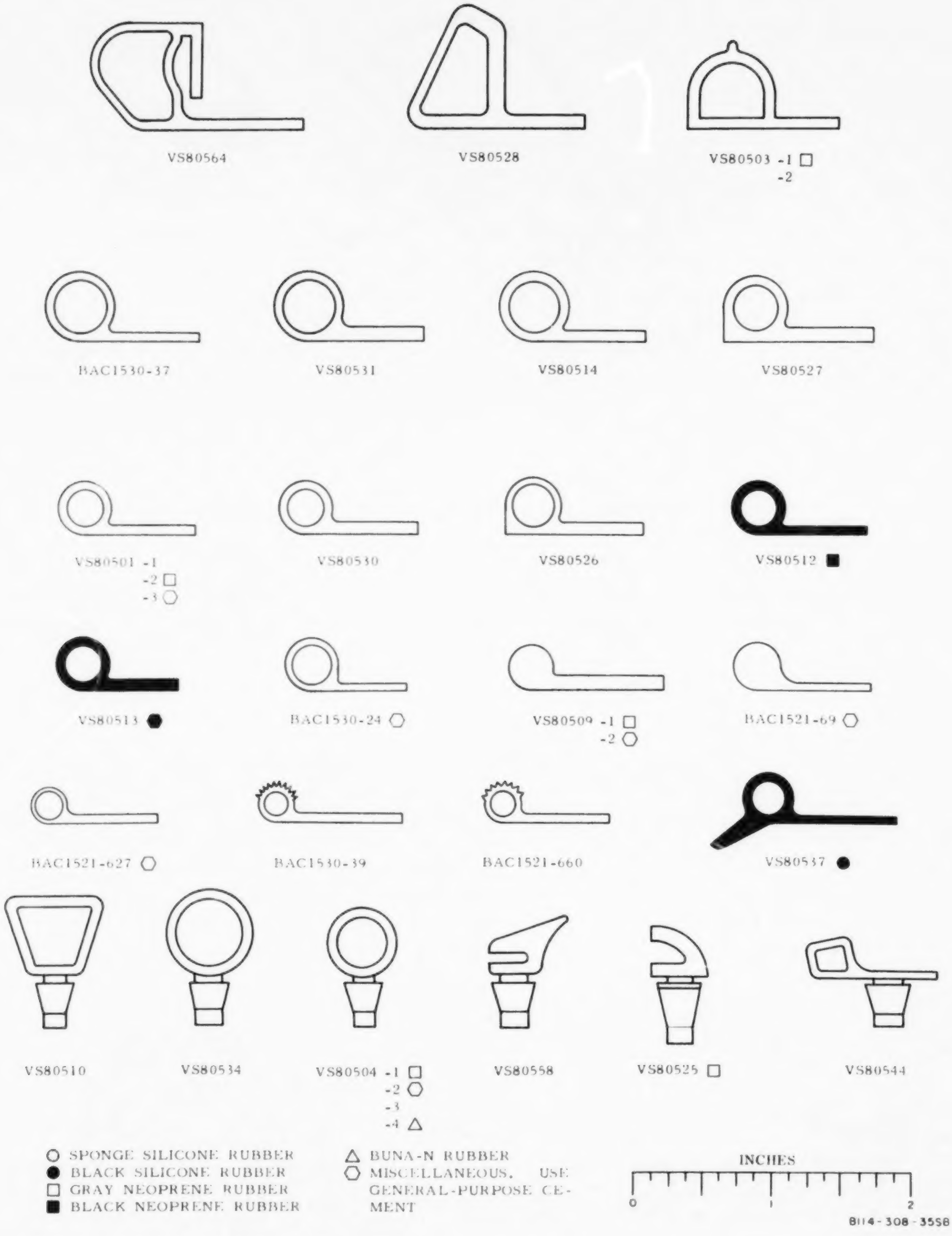

VS80564
VS80528
VS80503 -1 □
-2
BAC1530-37
VS80531
VS80514
VS80527
VS80501 -1
-2 □
-3 ⬡
VS80530
VS80526
VS80512 ■
VS80513 ⬢
BAC1530-24 ⬡
VS80509 -1 □
-2 ⬡
BAC1521-69 ⬡
BAC1521-627 ⬡
BAC1530-39
BAC1521-660
VS80537 ●
VS80510
VS80534
VS80504 -1 □
-2 ⬡
-3
-4 △
VS80558
VS80525 □
VS80544
○ SPONGE SILICONE RUBBER
● BLACK SILICONE RUBBER
□ GRAY NEOPRENE RUBBER
■ BLACK NEOPRENE RUBBER
△ BUNA-N RUBBER
⬡ MISCELLANEOUS. USE GENERAL-PURPOSE CEMENT
INCHES
0
1
2
8114-308-3558

Figure 2-130. Rubber Seal Repairs (Sheet 2 of 4)

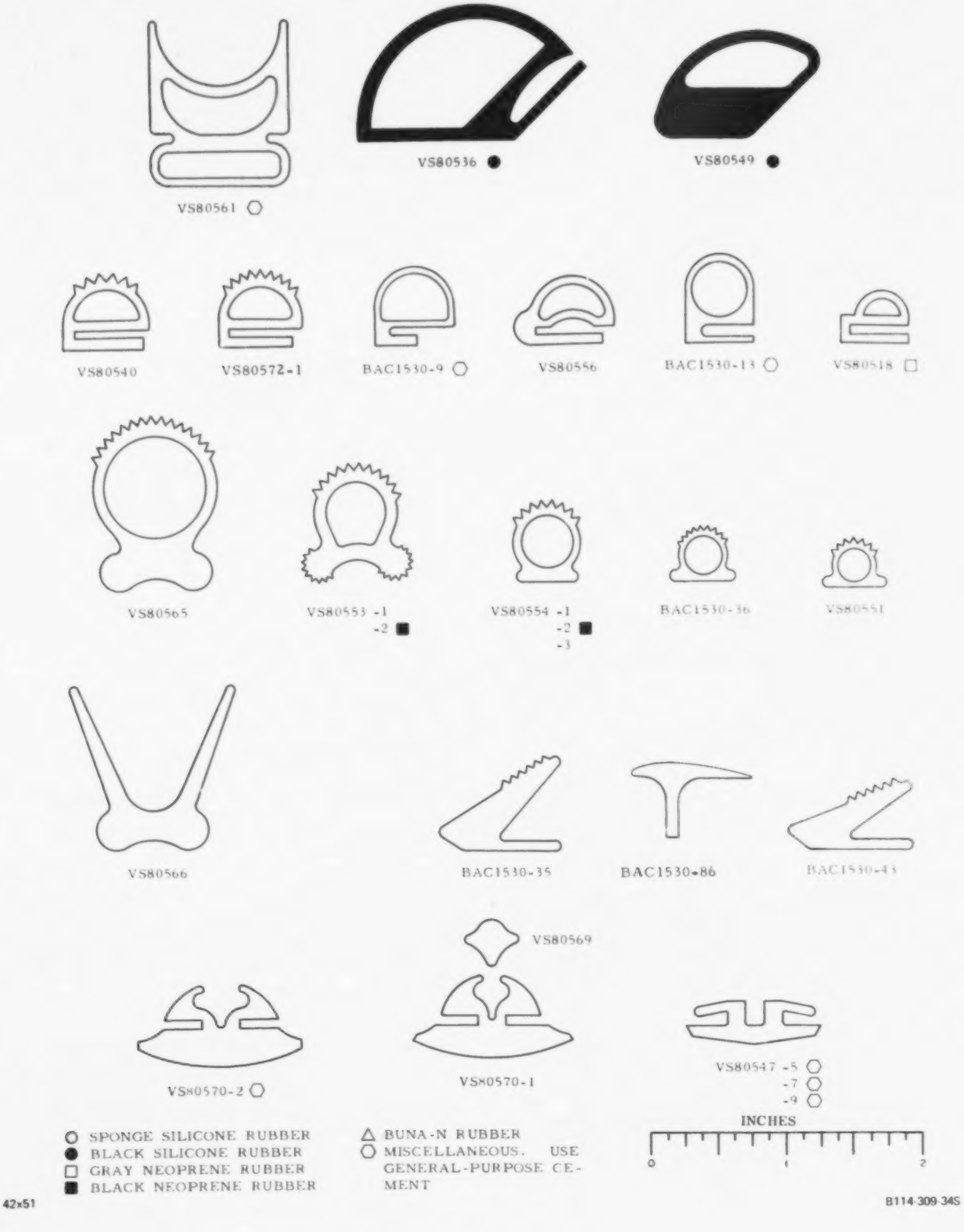

VS80561 ⬡
VS80536 ●
VS80549 ●
VS80540
VS80572-1
BAC1530-9 ⬡
VS80556
BAC1530-13 ⬡
VS80518 □
VS80565
VS80553 -1
-2 ■
VS80554 -1
-2 ■
-3
BAC1530-36
VS80551
VS80566
BAC1530-35
BAC1530-86
BAC1530-43
VS80569
VS80570-2 ⬡
VS80570-1
VS80547 -5 ⬡
-7 ⬡
-9 ⬡
INCHES
0
1
2
○ SPONGE SILICONE RUBBER
● BLACK SILICONE RUBBER
□ GRAY NEOPRENE RUBBER
■ BLACK NEOPRENE RUBBER
△ BUNA-N RUBBER
⬡ MISCELLANEOUS. USE GENERAL-PURPOSE CEMENT
42x51
B114-309-34S

Figure 2-130. Rubber Seal Repairs (Sheet 3 of 4)

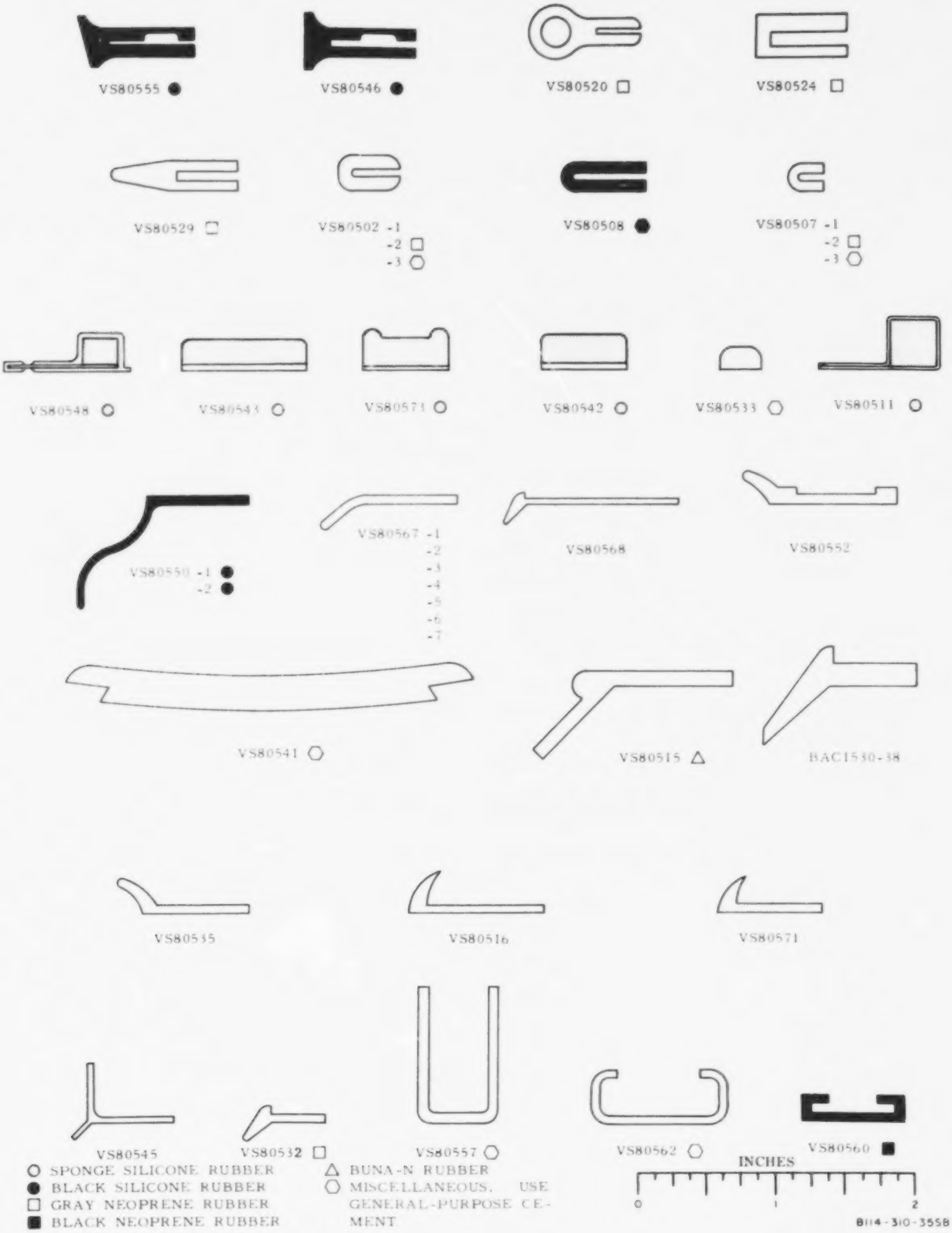
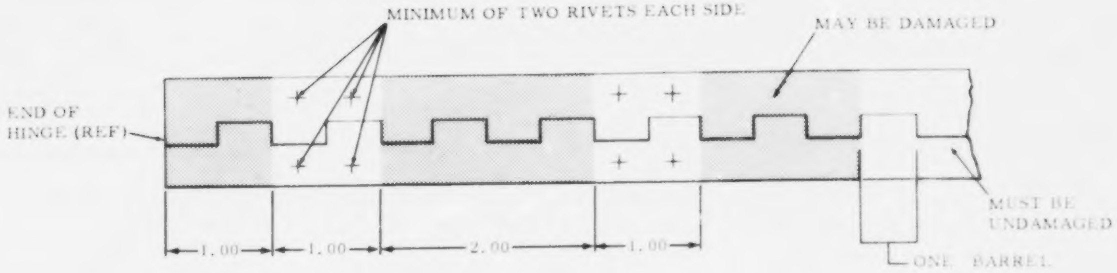

VS80555 ●
VS80546 ●
VS80520 □
VS80524 □
VS80529 □
VS80502 -1
-2 □
-3 ○
VS80508 ⬡
VS80507 -1
-2 □
-3 ⬡
VS80548 ○
VS80543 ○
VS80573 ○
VS80542 ○
VS80533 ⬡
VS80511 ○
VS80567 -1
-2
-3
-4
-5
-6
-7
VS80568
VS80552
VS80550 -1 ●
-2 ●
VS80541 ⬡
VS80515 △
BAC1530-38
VS80535
VS80516
VS80571
VS80545
VS80532 □
VS80557 ⬡
VS80562 ⬡
VS80560 ■
○ SPONGE SILICONE RUBBER
● BLACK SILICONE RUBBER
□ GRAY NEOPRENE RUBBER
■ BLACK NEOPRENE RUBBER
△ BUNA-N RUBBER
⬡ MISCELLANEOUS. USE GENERAL-PURPOSE CEMENT
INCHES
0
1
2
B114-310-3558

Figure 2-130. Rubber Seal Repairs (Sheet 4 of 4)

TYPE A INSTALLATION


MINIMUM OF TWO RIVETS EACH SIDE
MAY BE DAMAGED
END OF HINGE (REF)
MUST BE UNDAMAGED
1.00
1.00
2.00
1.00
ONE BARREL

DAMAGE CRITERIA - ALLOWABLE CONDITIONS:

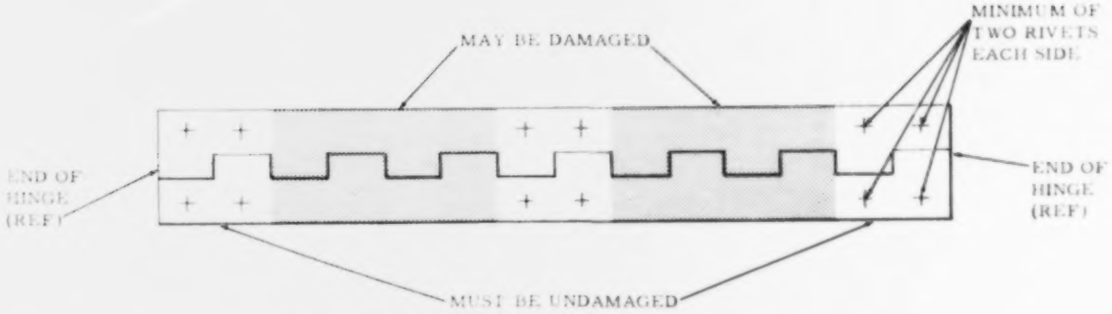
1. END OF HINGE MAY HAVE TWO BARRELS FAILED PROVIDED:
   a. THE NEXT TWO BARRELS ARE UNDAMAGED
   b. EACH UNDAMAGED SEGMENT HAS AT LEAST TWO ATTACHMENT RIVETS ON EACH SIDE
2. ANY FOUR CONSECUTIVE INNER BARRELS (AWAY FROM HINGE END) MAY BE FAILED PROVIDED:
   a. TWO ADJACENT BARRELS ON EACH END OF THE FAILED SECTION ARE UNDAMAGED
   b. EACH UNDAMAGED SEGMENT HAS AT LEAST TWO ATTACHMENT RIVETS ON EACH SIDE

SEE SHEET 2 FOR GENERAL NOTES

204-503-355H

Figure 2-131. Hinge Repairs (Sheet 1 of 2)

TYPE B INSTALLATION


MINIMUM OF TWO RIVETS EACH SIDE
MAY BE DAMAGED
END OF HINGE (REF)
END OF HINGE (REF)
MUST BE UNDAMAGED

DAMAGE CRITERIA – ALLOWABLE CONDITIONS:

1. EACH END MUST HAVE TWO UNDAMAGED BARRELS WITH TWO ATTACHMENT RIVETS ON EACH SIDE

2. ANY FOUR CONSECUTIVE INNER BARRELS (AWAY FROM HINGE END) MAY BE FAILED PROVIDED:

   a. TWO ADJACENT BARRELS ON EACH END OF THE FAILED SECTION ARE UNDAMAGED

   b. EACH UNDAMAGED SEGMENT HAS AT LEAST TWO ATTACHMENT RIVETS ON EACH SIDE

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REMOVE ALL BURRS AND SHARP EDGES AND ANY DISTORTED SECTION WHICH MAY CAUSE SUBSEQUENT DAMAGE
C. SHADED AREAS MAY BE COMPLETELY MISSING
D. REFER TO TABLE 2-25 FOR SPECIFIC APPLICATIONS

42x61

B114-514-345V

Figure 2-131. Hinge Repairs (Sheet 2 of 2)

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, Organizational Maintenance requirements for CH-47B/C aircraft.

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
CoA, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE 16 DEC 74

PUBLICATION NUMBER	DATE	TITLE
TM5-6115-200-20 AND P	1 APR 72	GENERATOR SET 10 KW NSN 6115-00-231-7286

BE EXACT. . .PIN-POINT WHERE IT IS PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN

SAMPLE

TEAR ALONG DOTTED LINE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
JOHN DOE, PFC (268) 317-7111	John Doe

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

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OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Commander
US Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MCTPC
4300 Goodfellow Boulevard
St. Louis, MO 63120

TEAR ALONG DOTTED LINE

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REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

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FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 55-1520-227-23-1	16 August 1978	AVIM and AVUM Maintenance Manual Army Model CH-47B/C Helicopters

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

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SIGN HERE:

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FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

Charts Transposed to
End of Volume.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = . 39 inch
1 decimenter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = . 15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = . 035 ounce
1 dekagram = 10 grams = . 35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = . 34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 38.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = . 155 sq. inch
1 sq. decimenter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = . 386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = . 06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	3.94
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	newton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

Bolt and Nut Material →	Steel, Corrosion Resistant Steel, and Titanium Bolts							Steel Bolts, 12-Point, External Wrenching BACB30FD and NAS 624-644	Steel Nut-Stud Assy		Aluminum Bolts (Anodized)		Aluminum Nut-Stud Assy	
Nut Type →	Self-Locking Nuts, Plate-Nuts and Castellated Nuts				Self-Locking External Wrenching Nuts	Self-Locking Castellated Nuts		Self-Locking External Wrenching Nuts	Self-Locking Nuts		Self-Locking and Castellated Nuts		Self-Locking Nuts	
	Tension		Shear		Tension	Tension	Shear	Tension	Tension	Shear	Tension		Tension	Shear
Nut Numbers →	AN310, AN363, AN365, MS20365, NAS679, NAS1021 MS21044, MS21045		AN320, AN364, MS20364, NAS1022 MS21083 MS21042		BACN10B	MS17825	MS17826 MS21224	BACN10B	MS20365 AN365 AN363 MS21044 MS21045	MS20364 AN364 MS21083 MS21042	MS20365D MS21044D AN310D		MS20365D AN365D MS21044D	MS20364D AN364D MS21083D MS21042D
	Torque Range													
Thread Size ↓	See Note 1	See Note 2	See Note 1	See Note 2	See Note 1	See Note 4	See Note 4	See Note 1	See Note 3	See Note 3	See Note 1	See Note 2	See Note 3	See Note 3
10-32	20-25	40	12-15	25	30-35	30-40	18-25		20-25	12-15			10-14	
1/4-28	50-70	100	30-40	60	65-90	75-95	40-60	75-100	50-70	30-40	25-35	50	25-35	15-20
5/16-24	100-140	225	60-85	140	130-180	190-210	100-125	145-200	100-140	60-85	50-70	100	50-70	30-40
3/8-24	160-190	390	95-110	240	220-360	300-350	160-200	250-410	160-190	95-110	84-140	190	80-100	45-60
7/16-20	450-500	840	270-300	500	370-610	450-700	270-350	420-690	450-500	270-300	145-240	330	220-250	130-150
1/2-20	480-690	1100	290-410	660	630-950		360-450	710-1070	480-695	290-405	250-370	500	240-350	140-210
9/16-18	800-1000	1600	480-600	960	1000-1300			1100-1470	805-995	480-600			400-500	240-300
5/8-18	1100-1300	2400	660-780	1400	1400-1700			1550-1900	1105-1295	660-780			555-645	340-395
3/4-16	2300-2500	5000	1300-1500	3000	2400-3100			2700-3500						
7/8-14	2500-3000	7000	1500-1800	4200	3700-4900			4150-5500						
1-12, 1-14	3700-5500	10000	2200-3300	6000	5100-7900			5750-8900						

CAUTION

Overtightening of fasteners will cause equipment damage, deformation, or failure of fasteners. All torque values are for dry (unlubricated) threads. If threads are lubricated, the limit is 70 percent of value in this table.

NOTES

1. Torque limits apply to nut tightening only. When tightening bolt, the higher limit ± 10 percent is used.
2. Maximum torque allowed for cotter pin hole alignment. If limit is exceeded, discard nut and bolt and inspect parts secured by the nut and bolt.
3. Torque limits apply only to tightening nut on stud.
4. When tightening self-locking castellated nuts MS21224, MS17825, and MS17826, first tighten to minimum torque. If slot in nut is aligned with cotter pin hole in bolt, tighten nut an additional 60° (one castellation) and install cotter pin. If slot in nut is not aligned with cotter pin hole in bolt, tighten nut until aligned and install cotter pin. In either case, maximum torque must not be exceeded.
5. Apply a coating of anti-seize compound (C61) or equivalent to the bushing OD on bolts 114R3650 series only.

CAUTION

Do not apply anti-seize compound to the bolt or nut threads.

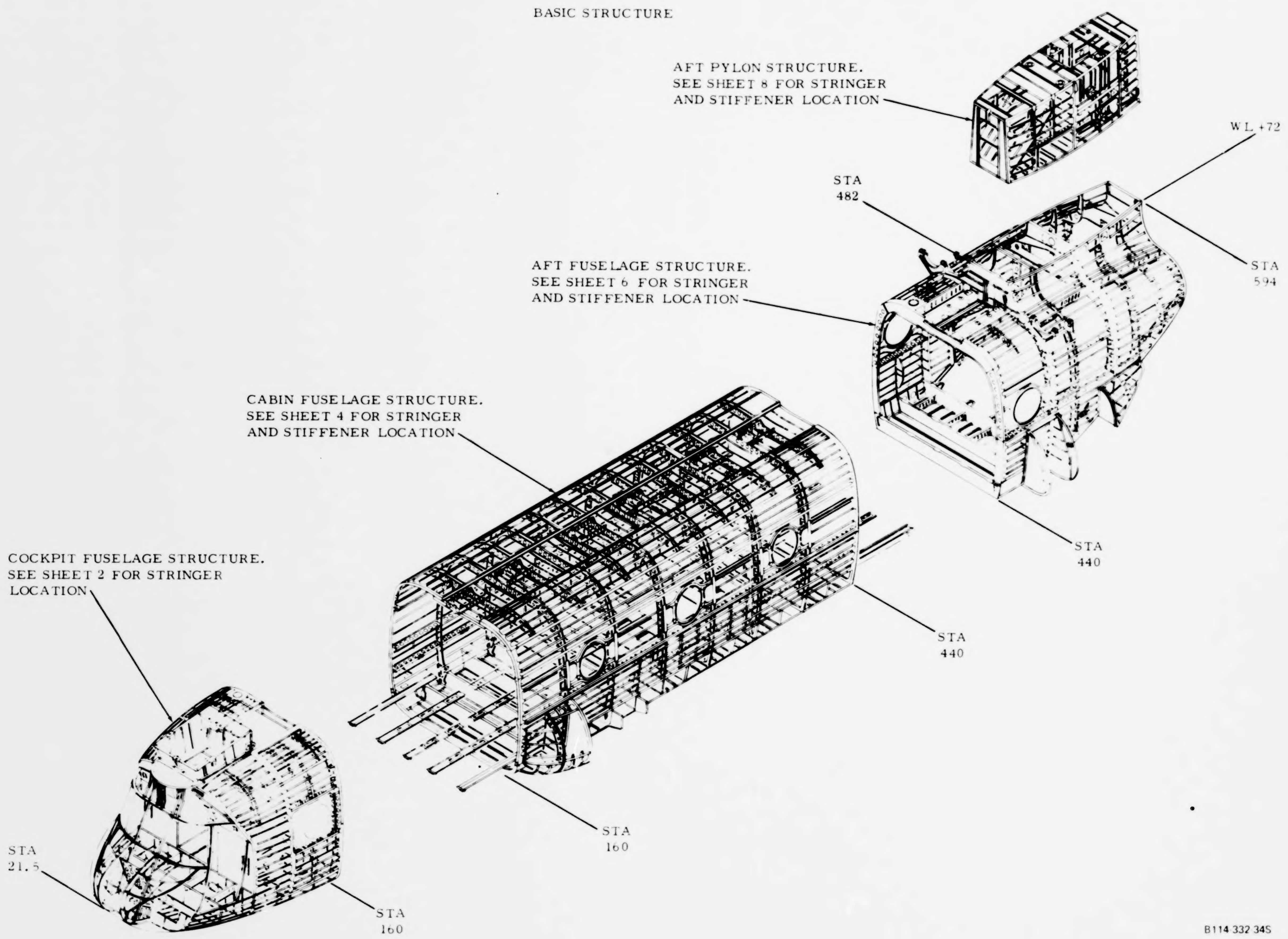
SELF-LOCKING NUT BREAKAWAY TORQUE VALUES

Thread Size	Minimum Breakaway Torque (in pound-inches)
8-32	1.5
10-32	2.0
1/4-28	3.5
5/16-24	6.5
3/8-24	9.5
7/16-20	14.0
1/2-20	18.0
9/16-18	24.0
5/8-18	32.0
3/4-16	50.0
7/8-14	70.0
1-12	90.0
1-1/8-12	117.0
1-1/4-12	143.0

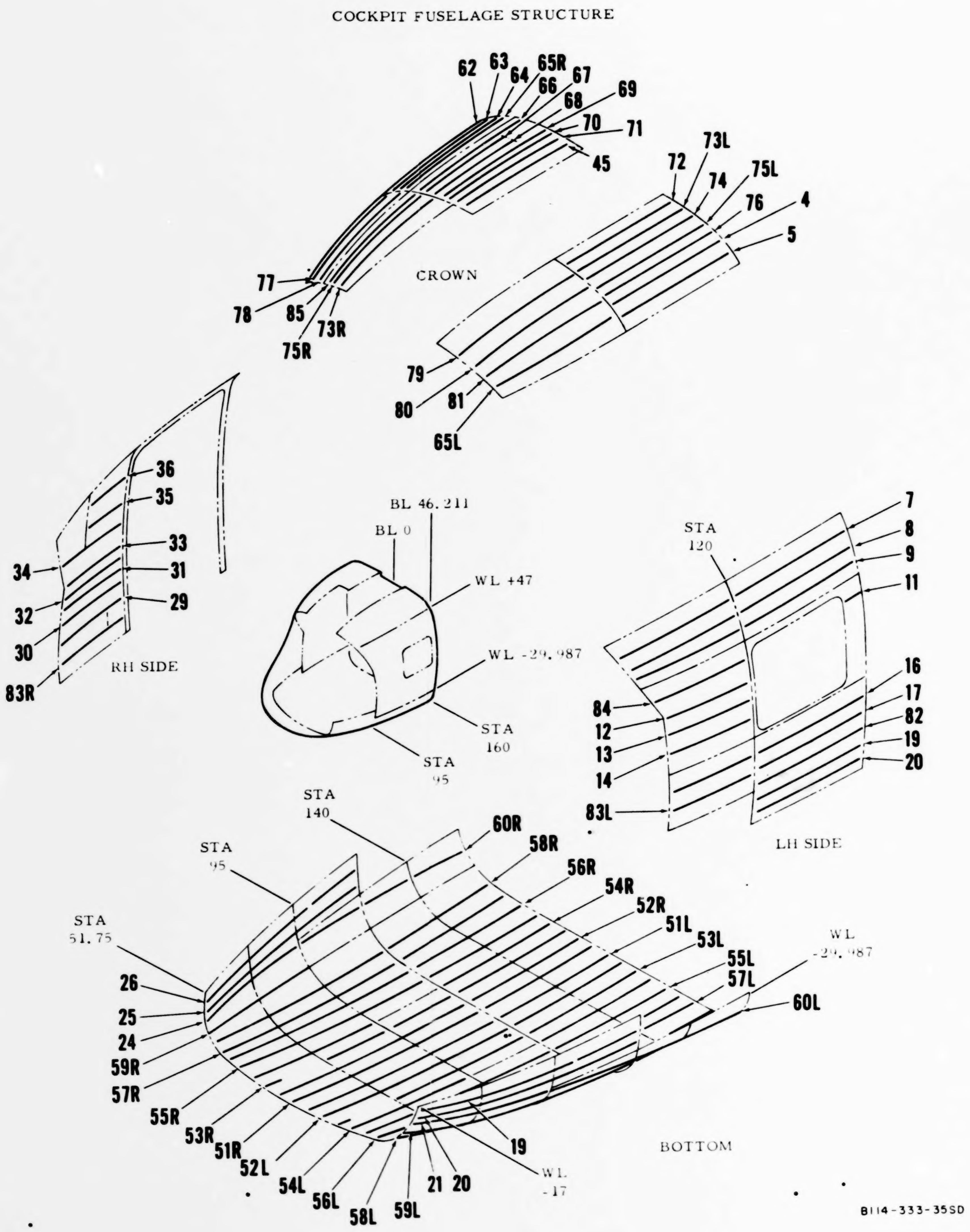
NOTE

To determine breakaway torque, thread the nut onto the screw or bolt until at least two threads protrude. The nut shall not make contact with a mating part. Stop the nut. The torque necessary to begin turning the nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet min breakaway torque.

FO-1. Standard Torque Limits and Breakaway Torque Values in Pound-Inches for Threaded Fasteners


BASIC STRUCTURE
AFT PYLON STRUCTURE. SEE SHEET 8 FOR STRINGER AND STIFFENER LOCATION
WL +72
STA 482
STA 594
AFT FUSELAGE STRUCTURE. SEE SHEET 6 FOR STRINGER AND STIFFENER LOCATION
CABIN FUSELAGE STRUCTURE. SEE SHEET 4 FOR STRINGER AND STIFFENER LOCATION
STA 440
STA 440
COCKPIT FUSELAGE STRUCTURE. SEE SHEET 2 FOR STRINGER LOCATION
STA 160
STA 21.5
STA 160
B114 332 345

FO-2. Stringer and Stiffener Identification (Sheet 1 of 9)


COCKPIT FUSELAGE STRUCTURE
62
63
64
65R
66
67
68
69
70
71
45
77
78
85
73R
75R
CROWN
72
73L
74
75L
76
4
5
79
80
81
65L
36
35
33
31
29
34
32
30
83R
RH SIDE
BL 46.211
BL 0
WL +47
WL -29.987
STA 160
STA 95
STA 120
7
8
9
11
16
17
82
19
20
84
12
13
14
83L
LH SIDE
STA 140
STA 95
STA 51.75
60R
58R
56R
54R
52R
51L
53L
55L
57L
WL -29.987
60L
26
25
24
59R
57R
55R
53R
51R
52L
54L
56L
58L
59L
21
20
19
WL -17
BOTTOM
B114-333-35SD

FO-2. Stringer and Stiffener Identification (Sheet 2 of 9)

STRINGERS--COCKPIT FUSELAGE STRUCTURE

STRINGER NO.	LOCATION			PART NO.	ORIGINAL MATERIAL		REPAIR MATERIAL	
	BL	WL	STATION					
4	37		120 THRU 160	114S1503-21	VS70503-2	7075-T6	0.040	7075-T6
5	42.08		120 THRU 160	114S1502-23	VS70503-2	7075-T6	0.040	7075-T6
7		+42.7	95 THRU 120	114S1501-45	VS70503-3	7075-T6	0.050	7075-T6
		+42.7	120 THRU 160	114S1501-51	VS70503-3	7075-T6	0.050	7075-T6
8		+38	95 THRU 120	114S1501-43	VS70503-2	7075-T6	0.040	7075-T6
		+38	120 THRU 160	114S1501-49	VS70503-3	7075-T6	0.050	7075-T6
9		+33.54	95 THRU 120	114S1501-41	VS70503-2	7075-T6	0.040	7075-T6
		+33.54	120 THRU 160	114S1501-47	VS70503-3	7075-T6	0.050	7075-T6
11		+23.2	154.5 THRU 160	114S1501-33	VS70503-1	7075-T6	0.032	7075-T6
12		+17.04	95 THRU 120	114S1501-37	VS70503-3	7075-T6	0.050	7075-T6
13		+11.6	95 THRU 120	114S1501-35	VS70503-3	7075-T6	0.050	7075-T6
14		+ 5.8	95 THRU 120	114S1501-31	VS70503-3	7075-T6	0.050	7075-T6
16		- 5.33	95 THRU 120	114S1501-29	VS70503-3	7075-T6	0.050	7075-T6
		- 5.33	120 THRU 160	114S1501-25	VS70503-3	7075-T6	0.050	7075-T6
17		-10.67	120 THRU 160	114S1501-23	VS70503-3	7075-T6	0.050	7075-T6
19		-19.5	51.75 THRU 100.78	114S1504-15	VS70503-2	7075-T6	0.040	7075-T6
		-20.67	100.78 THRU 120	114S1504-93	VS70503-2	7075-T6	0.040	7075-T6
		-20.67	120 THRU 169	114S1501-19	VS70503-2	7075-T6	0.040	7075-T6
20		-24	51.75 THRU 120	114S1504-17	VS70503-2	7075-T6	0.040	7075-T6
		-25.34	120 THRU 160	114S1501-17	VS70503-3	7075-T6	0.050	7075-T6
21		-28	51.75 THRU 95	114S1504-21	VS70503-2	7075-T6	0.040	7075-T6
24		-28	51.75 THRU 95	114S1504-22	VS70503-2	7075-T6	0.040	7075-T6
25		-24	51.75 THRU 120	114S1504-18	VS70503-2	7075-T6	0.040	7075-T6
26		-19.5	51.75 THRU 100.78	114S1504-16	VS70503-2	7075-T6	0.040	7075-T6
		-20.67	100.78 THRU 120	114S1504-94	VS70503-2	7075-T6	0.040	7075-T6
29		- 5.33	95 THRU 120	114S1502-31	VS70503-3	7075-T6	0.050	7075-T6
30		0	95 THRU 120	114S1502-45	VS70503-3	7075-T6	0.050	7075-T6
31		+ 5.80	95 THRU 120	114S1502-43	VS70503-3	7075-T6	0.050	7075-T6
32		+11.6	95 THRU 120	114S1502-41	VS70503-3	7075-T6	0.050	7075-T6
33		+17.04	95 THRU 120	114S1502-23	VS70503-3	7075-T6	0.050	7075-T6
34		+23.5	95 THRU 120	114S1502-21	VS70503-3	7075-T6	0.050	7075-T6
35		+28	105.75 THRU 120	114S1502-19	VS70503-3	7075-T6	0.050	7075-T6
36		+32	105.75 THRU 120	114S1502-17	VS70503-3	7075-T6	0.050	7075-T6
45R	15.25		120 THRU 160	114S1503-29	VS70503-2	7075-T6	0.040	7075-T6
51R	2.75		48 THRU 120	114S1504-59	VS70503-2	7075-T6	0.040	7075-T6
			120 THRU 160	114S1504-35	VS70503-1	7075-T6	0.032	7075-T6
51L	2.75		48 THRU 120	114S1504-57	VS70503-2	7075-T6	0.040	7075-T6
			120 THRU 160	114S1504-33	VS70503-1	7075-T6	0.032	7075-T6
52R	8		48 THRU 120	114S1504-56	VS70503-1	7075-T6	0.032	7075-T6
			120 THRU 160	114S1504-32	VS70503-1	7075-T6	0.032	7075-T6
52L	8		48 THRU 120	114S1504-55	VS70503-1	7075-T6	0.032	7075-T6
			120 THRU 160	114S1504-31	VS70503-1	7075-T6	0.032	7075-T6
53R	13		48 THRU 54	114S1504-62	VS70503-1	7075-T6	0.032	7075-T6
			70.62 THRU 120	114S1504-51	VS70503-1	7075-T6	0.032	7075-T6
			120 THRU 160	114S1504-32	VS70503-1	7075-T6	0.032	7075-T6
53L	13		48 THRU 54	114S1504-61	VS70503-1	7075-T6	0.032	7075-T6
			70.62 THRU 95	114S1504-49	VS70503-1	7075-T6	0.032	7075-T6
			95 THRU 120	114S1504-53	VS70503-1	7075-T6	0.032	7075-T6
			120 THRU 160	114S1504-31	VS70503-1	7075-T6	0.032	7075-T6
54R	17.8		48 THRU 95	114S1504-63	VS70503-1	7075-T6	0.032	7075-T6
	18.75		120 THRU 160	114S1504-32	VS70503-1	7075-T6	0.032	7075-T6
54L	17.8		48 THRU 95	114S1504-47	VS70503-1	7075-T6	0.032	7075-T6
	18.75		120 THRU 160	114S1504-31	VS70503-1	7075-T6	0.032	7075-T6
55R	22.22		48 THRU 120	114S1504-65	VS70503-1	7075-T6	0.032	7075-T6
	23.38		120 THRU 160	114S1504-30	VS70503-1	7075-T6	0.032	7075-T6
55L	22.22		48 THRU 120	114S1504-45	VS70503-1	7075-T6	0.032	7075-T6
	23.38		120 THRU 160	114S1504-29	VS70503-1	7075-T6	0.032	7075-T6
56R	26.31		48 THRU 120	114S1504-44	VS70503-1	7075-T6	0.032	7075-T6
	28.75		120 THRU 160	114S1504-28	VS70503-1	7075-T6	0.032	7075-T6
56L	26.31		48 THRU 120	114S1504-43	VS70503-1	7075-T6	0.032	7075-T6
	28.75		120 THRU 160	114S1504-27	VS70503-1	7075-T6	0.032	7075-T6
57R	29.65		48 THRU 120	114S1504-98	ALCOA 9802	7075-T6	0.050	4130
	34.38		120 THRU 160	114S1504-26	VS70503-1	7075-T6	0.032	7075-T6
57L	29.65		48 THRU 120	114S1504-41	VS70503-2	7075-T6	0.040	7075-T6
	34.38		120 THRU 160	114S1504-25	VS70503-1	7075-T6	0.032	7075-T6
58R	31.9		48 THRU 120	114S1504-40	VS70503-3	7075-T6	0.050	7075-T6
	40.19		120 THRU 160	114S1504-24	VS70503-1	7075-T6	0.032	7075-T6
58L	31.9		48 THRU 120	114S1504-39	VS70503-3	7075-T6	0.050	7075-T6
	40.19		120 THRU 160	114S1504-23	VS70503-1	7075-T6	0.032	7075-T6
59R	33.67		48 THRU 95	114S1504-38	VS70503-3	7075-T6	0.050	7075-T6
59L	33.67		48 THRU 95	114S1504-119	VS70503-3	7075-T6	0.050	7075-T6
60R	46	33	95 THRU 120	114S1504-73	VS70503-1	7075-T6	0.032	7075-T6
	48	34.5	120 THRU 140	114S1504-67	AND10135-1002	7075-T6	0.063	4130
	50.04	35	140 THRU 160	114S1504-69	AND10135-1002	7075-T6	0.063	4130
60L	46	33	95 THRU 120	114S1504-71	VS70503-1	7075-T6	0.032	7075-T6
	50.04	35	120 THRU 160	114S1504-19	VS70503-1	7075-T6	0.032	7075-T6
62	50.53		120 THRU 160	114S1503-53	HARVEY 17716	7075-T6	0.080	4130
63	47.02		120 THRU 160	114S1503-51	HARVEY 17716	7075-T6	0.080	4130
64	44.28		120 THRU 160	114S1503-49	HARVEY 17716	7075-T6	0.080	4130
65R	40.88		120 THRU 160	114S1503-47	HARVEY 17716	7075-T6	0.080	4130
65L	40		85 THRU 120	114S1503-27	VS70503-2	7075-T6	0.040	7075-T6
66	31.98		120 THRU 160	114S1503-41	VS70503-1	7075-T6	0.032	7075-T6
67	29.02		120 THRU 150	114S1503-39	VS70503-1	7075-T6	0.032	7075-T6
68	26.03		120 THRU 150	114S1503-37	VS70503-1	7075-T6	0.032	7075-T6
69	23.03		120 THRU 160	114S1503-35	VS70503-1	7075-T6	0.032	7075-T6
70	20.5		120 THRU 160	114S1503-33	VS70503-1	7075-T6	0.032	7075-T6
71	18.09		120 THRU 160	114S1503-31	AND10133-1002	7075-T6	0.100	4130
72	20.5		120 THRU 160	114S1503-11	VS70503-2	7075-T6	0.040	7075-T6
73	24		85 THRU 120	114S1503-43	VS70503-3	7075-T6	0.050	7075-T6
73	24.39		120 THRU 160	114S1503-13	VS70503-2	7075-T6	0.040	7075-T6
74	27.57		120 THRU 160	114S1503-15	VS70503-1	7075-T6	0.032	7075-T6
75	27		85 THRU 120	114S1503-45	VS70503-3	7075-T6	0.050	7075-T6
75	30.77		120 THRU 160	114S1503-17	VS70503-1	7075-T6	0.032	7075-T6
76	33.9		120 THRU 160	114S1503-19	VS70503-1	7075-T6	0.032	7075-T6
77	48		85 THRU 120	114S1503-55	VS70503-1	7075-T6	0.032	7075-T6
78	43		85 THRU 120	114S1503-57	VS70503-1	7075-T6	0.032	7075-T6
79	24		85 THRU 120	114S1503-59	VS70503-2	7075-T6	0.040	7075-T6
80	29		85 THRU 120	114S1503-61	VS70503-2	7075-T6	0.040	7075-T6
82		-15.67	120 THRU 160	114S1501-21	VS70503-2	7075-T6	0.040	7075-T6
83R		-11.17	95 THRU 120	114S1502-33	VS70503-3	7075-T6	0.050	7075-T6
83L		-11.17	95 THRU 120	114S1501-27	VS70503-3	7075-T6	0.050	7075-T6
84		+24.3	95 THRU 120	114S1501-67	VS70503-3	7075-T6	0.050	7075-T6
85	30		85 THRU 120	114S1503-69	VS70503-3	7075-T6	0.050	7075-T6

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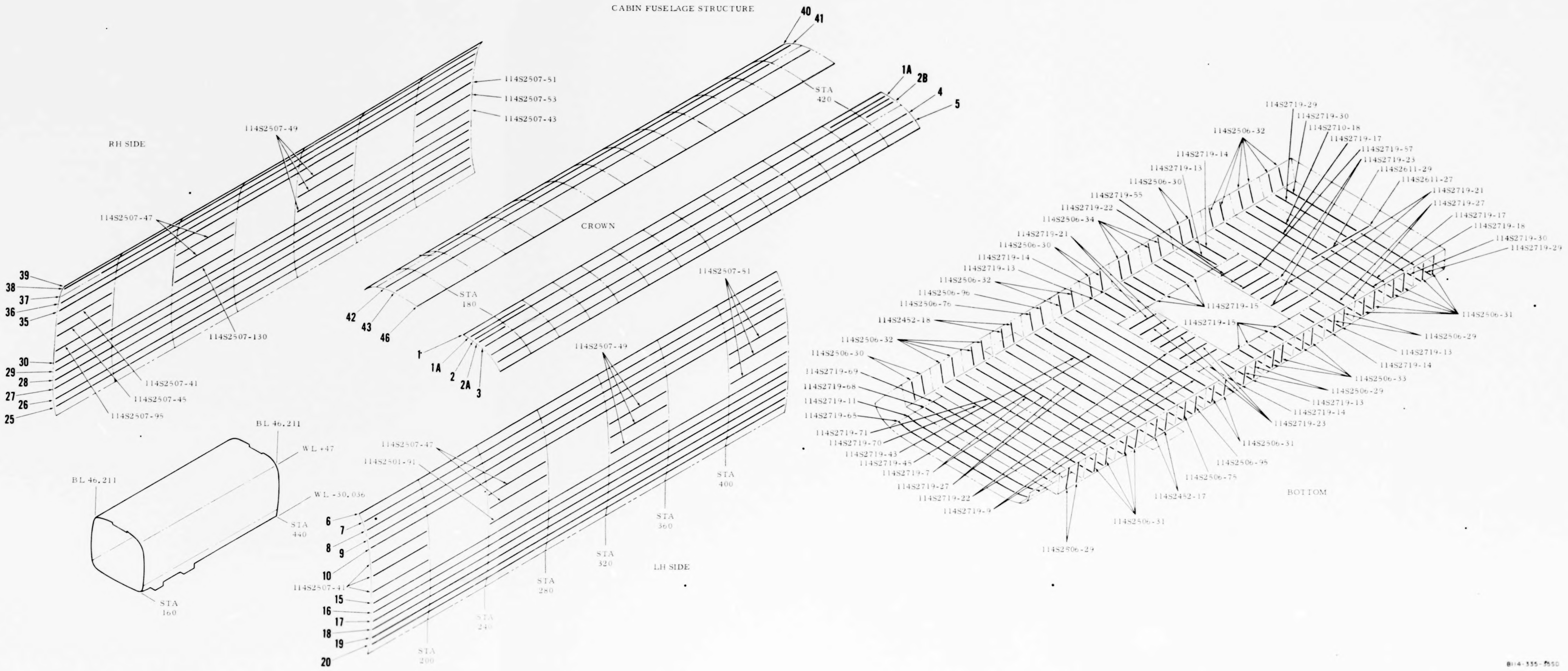
NOTE

ALL DIMENSIONS ARE IN INCHES

B114-334-345

FO-2. Stringer and Stiffener Identification (Sheet 3 of 9)


CABIN FUSELAGE STRUCTURE
RH SIDE
114S2507-51
114S2507-53
114S2507-43
114S2507-49
114S2507-47
39
38
37
36
35
114S2507-130
30
29
28
27
26
25
114S2507-41
114S2507-45
114S2507-95
40
41
STA
420
1A
2B
4
5
CROWN
42
43
46
STA
180
1
1A
2
2A
3
114S2507-51
114S2507-49
BL 46.211
WL +47
BL 46.211
WL -30.036
STA
440
STA
160
114S2507-47
114S2501-91
6
7
8
9
10
114S2507-41
15
16
17
18
19
20
STA
200
STA
240
STA
280
STA
320
STA
360
STA
400
LH SIDE
114S2719-29
114S2719-30
114S2710-18
114S2719-17
114S2719-57
114S2719-23
114S2611-29
114S2611-27
114S2719-21
114S2719-27
114S2719-17
114S2719-18
114S2719-30
114S2719-29
114S2506-32
114S2719-14
114S2719-13
114S2506-30
114S2719-55
114S2719-22
114S2506-34
114S2719-21
114S2506-30
114S2719-14
114S2719-13
114S2506-32
114S2506-96
114S2506-76
114S2452-18
114S2719-15
114S2719-15
114S2506-31
114S2506-29
114S2719-13
114S2719-14
114S2506-33
114S2506-29
114S2719-13
114S2719-14
114S2719-23
114S2506-32
114S2506-30
114S2719-69
114S2719-68
114S2719-11
114S2719-65
114S2719-71
114S2719-70
114S2719-43
114S2719-45
114S2719-7
114S2719-27
114S2719-22
114S2719-9
114S2506-31
114S2506-95
114S2506-75
114S2452-17
114S2506-31
114S2506-29
BOTTOM
B114-335-5550

FO-2. *Stringer and Stiffener Identification (Sheet 4 of 9)*

STRINGERS--AFT FUSELAGE STRUCTURE

STRINGER NO. (NOTE B)	LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
	BL	WL	STATION			
1A	22.86		440 THRU 482	114S3503-49	ALCOA 28172 7075-T6	0.063 4130
2	25.72		440 THRU 482	114S3503-49	ALCOA 28172 7075-T6	0.063 4130
	25.72		482 THRU 534	114S3503-41	ALCOA 28172 7075-T6	0.063 4130
	25.72		534 THRU 594	114S3503-27	ALCOA 83264 7075-T6	0.050 4130
2B	28.53		440 THRU 482	114S3503-49	ALCOA 28172 7075-T6	0.063 4130
	28.53		482 THRU 534	114S3503-39	ALCOA 28172 7075-T6	0.063 4130
	28.53		534 THRU 594	114S3503-25	ALCOA 83264 7075-T5	0.050 4130
3	31.4		440 THRU 482	114S3354-303	AND10136-1406 7075-T6	0.100 4130
4	37		502 THRU 534	114S3503-35	ALCOA 28172 7075-T6	0.063 4130
	37		534 THRU 594	114S3503-23	ALCOA 83264 7075-T6	0.050 4130
5	42.1		440 THRU 482	114S3503-47	ALCOA 28172 7075-T6	0.063 4130
	42.1		482 THRU 534	114S3503-33	ALCOA 83264 7075-T6	0.050 4130
	42.1		534 THRU 594	114S3503-21	ALCOA 83264 7075-T6	0.050 4130
				114S3503-389	ALCOA 83264 7075-T6	0.050 4130
7 ◫		+42.7	440 THRU 482	114S3501-95	ALCOA 83264 7075-T6	0.050 4130
⊟		+42.7	502 THRU 534	114S3501-113	ALCOA 83264 7075-T6	0.050 4130
		+42.7	534 THRU 594	114S3501-135	ALCOA 83264 7075-T6	0.050 4130
8 ◫		+38	440 THRU 482	114S3501-227	AND10134-1202 7075-T6	0.100 4130
⊟				114S3501-388	AND10134-1202 7075-T6	0.100 4130
		+38	482 THRU 534	114S3501-111	ALCOA 83264 7075-T6	0.050 4130
		+38	534 THRU 594	114S3501-133	ALCOA 83264 7075-T6	0.050 4130
9		+33.54	440 THRU 482	114S3501-91	ALCOA 83264 7075-T6	0.050 4130
		+33.54	482 THRU 534	114S3501-107	ALCOA 83264 7075-T6	0.050 4130
		+33.54	534 THRU 594	114S3501-131	ALCOA 83264 7075-T6	0.050 4130
10		+29	482 THRU 534	114S3501-225	ALCOA 83264 7075-T6	0.050 4130
		+29	534 THRU 594	114S3501-129	ALCOA 83264 7075-T6	0.050 4130
11		+23.2	482 THRU 534	114S3501-107	ALCOA 83264 7075-T6	0.050 4130
		+23.2	534 THRU 594	114S3501-127	ALCOA 83264 7075-T6	0.050 4130
12 ⧄		+17.04	482 THRU 534	114S3501-107	ALCOA 83264 7075-T6	0.050 4130
⧅				114S3501-372	ALCOA 83264 7075-T6	0.050 4130
		+17.04	534 THRU 592	114S3501-123	ALCOA 83264 7075-T6	0.050 4130
13 ◫		+11.6	482 THRU 534	114S3501-103	ALCOA 83264 7075-T6	0.050 4130
⊞				114S3501-391	ALCOA 83264 7075-T6	0.050 4130
⧅				114S3501-371	ALCOA 83264 7075-T6	0.050 4130
		+11.6	534 THRU 583	114S3501-117	ALCOA 83264 7075-T6	0.050 4130
14 ◫		+ 5.8	482 THRU 534	114S3501-103	ALCOA 83264 7075-T6	0.050 4130
⊟				114S3501-391	ALCOA 83264 7075-T6	0.050 4130
		+ 5.8	534 THRU 573.5	114S3501-115	ALCOA 83264 7075-T6	0.050 4130
16		- 5.33	440 THRU 478	114S3501-89	ALCOA 83264 7075-T6	0.050 4130
		- 5.33	482 THRU 520	114S3501-153	ALCOA 83264 7075-T6	0.050 4130
17		-10.67	440 THRU 478	114S3501-89	ALCOA 83264 7075-T6	0.050 4130
		-10.67	482 THRU 520	114S3501-153	ALCOA 83264 7075-T6	0.050 4130
18 ⧄		-16	440 THRU 482	114S3501-87	ALCOA 83264 7075-T6	0.050 4130
⧅				114S3501-367	ALCOA 83264 7075-T6	0.050 4130
		-16	482 THRU 520	114S3501-101	ALCOA 83264 7075-T6	0.050 4130
19 ⧄		-20.67	440 THRU 482	114S3501-87	ALCOA 83264 7075-T6	0.050 4130
⧅				114S3501-367	ALCOA 83264 7075-T6	0.050 4130
		-20.67	482 THRU 520	114S3501-99	ALCOA 83264 7075-T6	0.050 4130
20		-25.34	440 THRU 482	114S3501-85	ALCOA 83264 7075-T6	0.050 4130
25		-25.34	440 THRU 482	114S3501-86	ALCOA 83264 7075-T6	0.050 4130
26		-20.67	440 THRU 482	114S3501-88	ALCOA 83264 7075-T6	0.050 4130
		-20.67	482 THRU 520	114S3501-100	ALCOA 83264 7075-T6	0.050 4130
27		-16	440 THRU 482	114S3501-88	ALCOA 83264 7075-T6	0.050 4130
		-16	482 THRU 520	114S3501-102	ALCOA 83264 7075-T6	0.050 4130
28		-10.67	440 THRU 482	114S3501-90	ALCOA 83264 7075-T6	0.050 4130
		-10.67	482 THRU 520	114S3501-154	ALCOA 83264 7075-T6	0.050 4130
29		- 5.33	440 THRU 482	114S3501-90	ALCOA 83264 7075-T6	0.050 4130
		- 5.33	482 THRU 520	114S3501-154	ALCOA 83264 7075-T6	0.050 4130
31		+ 5.8	482 THRU 534	114S3501-105	ALCOA 83264 7075-T6	0.050 4130
		+ 5.8	534 THRU 573.5	114S3501-116	ALCOA 83264 7075-T6	0.050 4130
32		+11.6	482 THRU 534	114S3501-105	ALCOA 83264 7075-T6	0.050 4130
		+11.6	534 THRU 555.8	114S3501-119	ALCOA 83264 7075-T6	0.050 4130
33		+17.04	482 THRU 534	114S3501-108	ALCOA 83264 7075-T6	0.050 4130
		+17.04	534 THRU 592	114S3501-125	ALCOA 83264 7075-T6	0.050 4130
34		+23.2	482 THRU 534	114S3501-108	ALCOA 83264 7075-T6	0.050 4130
		+23.2	534 THRU 594	114S3501-81	ALCOA 83264 7075-T6	0.050 4130
35		+29	482 THRU 534	114S3501-226	AND10138-1005 7075-T6	0.080 4130
		+29	534 THRU 594	114S3501-130	ALCOA 83264 7075-T6	0.050 4130
36		+33.54	440 THRU 482	114S3501-92	ALCOA 83264 7075-T6	0.050 4130
		+33.54	482 THRU 534	114S3501-108	ALCOA 83264 7075-T6	0.050 4130
		+33.54	534 THRU 594	114S3501-132	ALCOA 83264 7075-T6	0.050 4130
37		+38	440 THRU 482	114S3501-228	AND10134-1202 7075-T6	0.100 4130
		+38	482 THRU 534	114S3501-112	ALCOA 83264 7075-T6	0.050 4130
		+38	534 THRU 561	114S3501-157	ALCOA 83264 7075-T6	0.050 4130
		+38	569.5 THRU 594	114S3501-175	ALCOA 83264 7075-T6	0.050 4130
38		+42.7	440 THRU 482	114S3501-96	ALCOA 83264 7075-T6	0.050 4130
		+42.7	502 THRU 534	114S3501-114	ALCOA 83264 7075-T6	0.050 4130
		+42.7	534 THRU 594	114S3501-136	ALCOA 83264 7075-T6	0.050 4130
40	42.1		440 THRU 482	114S3503-55	ALCOA 28172 7075-T6	0.063 4130
	42.1		482 THRU 534	114S3505-34	ALCOA 83264 7075-T6	0.050 4130
	42.1		534 THRU 594	114S3503-22	ALCOA 83264 7075-T6	0.050 4130
41	37		502 THRU 534	114S3503-36	ALCOA 28172 7075-T6	0.063 4130
	37		534 THRU 594	114S3503-24	ALCOA 83264 7075-T6	0.050 4130
42	31.4		440 THRU 482	114S3354-288	AND10136-1406 7075-T6	0.100 4130
42B	28.52		450 THRU 482	114S3503-51	ALCOA 28172 7075-T6	0.063 4130
			482 THRU 534	114S3503-40	ALCOA 28172 7075-T6	0.063 4130
			534 THRU 594	114S3503-26	ALCOA 83264 7075-T6	0.050 4130
43	25.72		450 THRU 482	114S3503-51	ALCOA 28172 7075-T6	0.063 4130
	25.72		482 THRU 534	114S3503-42	ALCOA 28172 7075-T6	0.063 4130
	25.72		534 THRU 594	114S3503-28	ALCOA 83264 7075-T6	0.050 4130
43A	22.86		450 THRU 482	114S3503-51	ALCOA 28172 7075-T6	0.063 4130
--		+ 9.85	555.8 THRU 580.4	114S3501-121	ALCOA 83264 7075-T6	0.050 4130
--		- 2.38	520 THRU 534	114S3501-141	ALCOA 83264 7075-T6	0.050 4130
--		- 2.38	520 THRU 534	114S3501-142	ALCOA 83264 7075-T6	0.050 4130
--		0	520 THRU 555	114S3501-143	0.051 2024-T4 CLAD	0.063 2024-T4 CLAD
--		0	520 THRU 555	114S3501-144	0.051 2024-T4 CLAD	0.063 2024-T4 CLAD
--		- 2.38	534 THRU 555	114S3501-171	ALCOA 83264 7075-T6	0.050 4130
--		- 2.38	534 THRU 555	114S3501-172	ALCOA 83264 7075-T6	0.050 4130
--		- 7	534 THRU 546	114S3501-173	ALCOA 83264 7075-T6	0.050 4130
--		- 7	534 THRU 546	114S3501-174	ALCOA 83264 7075-T6	0.050 4130
--		- 7	520 THRU 534	114S3501-355	ALCOA 83264 7075-T6	0.050 4130
--		- 7	520 THRU 534	114S3501-356	ALCOA 83264 7075-T6	0.050 4130
--		+59	534 THRU 594	114S3503-29	ALCOA 83264 7075-T6	0.050 4130
--		+59	534 THRU 594	114S3503-30	ALCOA 83264 7075-T6	0.050 4130
--		+60	482 THRU 534	114S3503-43	ALCOA 60806 7075-T6	0.080 4130
--		+66	482 THRU 534	114S3503-45	ALCOA 83264 7075-T6	0.050 4130
--		+66	482 THRU 534	114S3503-46	ALCOA 83264 7075-T6	0.050 4130
--		+66	534 THRU 594	114S3503-53	ALCOA 83264 7075-T6	0.050 4130
--		+54	575.5 THRU 594	114S3503-89	ALCOA 83264 7075-T6	0.050 4130
--		+54	575.5 THRU 594	114S3503-90	ALCOA 83264 7075-T6	0.050 4130
--		+62	575.5 THRU 594	114S3503-91	ALCOA 83264 7075-T6	0.050 4130
--		+62	575.5 THRU 594	114S3503-92	ALCOA 83264 7075-T6	0.050 4130
--		+60	482 THRU 534	114S3503-99	ALCOA 83264 7075-T6	0.050 4130
--		+62	569.5 THRU 594	114S3503-191	ALCOA 83264 7075-T6	0.050 4130
--		+66	534 THRU 575	114S3503-193	ALCOA 83264 7075-T6	0.050 4130
--		+66	586 THRU 594	114S3503-195	ALCOA 83264 7075-T6	0.050 4130

◫ USED ON HELICOPTERS, 66-19098 THRU 67-18445
⊟ USED ON HELICOPTERS, 67-18446 AND SUBSEQUENT
⧄ USED ON HELICOPTERS, 66-19098 THRU 67-18495
⧅ USED ON HELICOPTERS, 67-18494 AND SUBSEQUENT
⊞ USED ON HELICOPTERS, 67-18446 THRU 67-18493

STIFFENERS--AFT FUSELAGE STRUCTURE

LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
BL	WL	STATION			
48R THRU 48L		446.6	114S2719-25	0.040 7075-T6 CLAD	0.050 7075-T6
48R THRU 48L		453.6	114S2719-25	0.040 7075-T6 CLAD	0.050 7075-T6
	-20 THRU -33	496.3	114S3501-151	ALCOA 67580 7075-T6	0.050 4130
	-20 THRU -33	496.3	114S3501-152	ALCOA 67580 7075-T6	0.050 4130
	+12	482 THRU 502	114S3501-207	ALCOA 83264 7075-T6	0.050 4130
	+ 4.5	482 THRU 502	114S3501-209	0.063 7075-T6 CLAD	0.071 7075-T6
	-20 THRU -36	489.2	114S3501-243	AND10134-1401 7075-T6	0.100 4130
	-20 THRU -36	489.2	114S3501-244	AND10134-1401 7075-T6	0.100 4130
	+15	520 THRU 534	114S3501-247	0.063 7075-T6 CLAD	0.071 7075-T6
	+15	520 THRU 534	114S3501-248	0.063 7075-T6 CLAD	0.071 7075-T6
5R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
10R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
15R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
26R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
32R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
38R		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
5L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
10L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
15L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
26L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
32L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
38L		460 THRU 482	114S3504-17	ALCOA 67580 7075-T6	0.050 4130
53.1R		460 THRU 482	114S3504-43	BAC1503-100019 7075-T6	0.160 4130
53.1L		460 THRU 482	114S3504-43	BAC1503-100019 7075-T6	0.160 4130
68.2R		460 THRU 482	114S3504-43	BAC1503-100019 7075-T6	0.160 4130
68.2L		460 THRU 482	114S3504-43	BAC1503-100019 7075-T6	0.160 4130
57L		460 THRU 482	114S3504-45	AND10137-2601 7075-T6	0.125 4130
57R		460 THRU 482	114S3504-46	AND10137-2601 7075-T6	0.125 4130

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. UNNUMBERED STRINGERS AND ALL STIFFENERS ARE IDENTIFIED BY PART NUMBER

F/Ox54

B114-338-345M

FO-2. Stringer and Stiffener Identification (Sheet 7 of 9)

STRINGERS--CABIN FUSELAGE STRUCTURE

STRINGER NO. (NOTE B)	LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
	BL	WL	STATION			
1	20			114S2503-253	VS905113 7075-T6	NOTE C.
1A	22.86		160 THRU 200	114S2503-57	ALCOA 83264 7075-T6	0.050 4130
			400 THRU 440	114S2503-59	ALCOA 83264 7075-T6	0.050 4130
2	25.72		160 THRU 440	114S2503-51	ALCOA 83264 7075-T6	0.050 4130
2A	28.56		160 THRU 180	114S2503-55	ALCOA 83264 7075-T6	0.050 4130
2B	28.03		420 THRU 440	114S2503-56	ALCOA 83264 7075-T6	0.050 4130
3	31.4		160 THRU 420	114S2503-247	ALCOA 83264 7075-T6	0.050 4130
4	37		160 THRU 440	114S2503-51	ALCOA 83264 7075-T6	0.050 4130
5	42.1		160 THRU 440	114S2503-51	ALCOA 83264 7075-T6	0.050 4130
6	46.21	+47	160 THRU 440	114S2001-27	AND10136-3001 7075-T6	0.125 4130
7 ⧄		+42.7	160 THRU 440	114S2501-45	ALCOA 83264 7075-T6	0.050 4130
⧅				114S2501-211	ALCOA 83264 7075-T6	0.050 4130
8 ⧄		+38	160 THRU 440	114S2501-45	ALCOA 83264 7075-T6	0.050 4130
⧅				114S2501-209	ALCOA 83264 7075-T6	0.050 4130
9		+33.54	160 THRU 440	114S2501-45	ALCOA 83264 7075-T6	0.050 4130
10		+29	160 THRU 440	114S2001-19	ALCOA 49225 7075-T6	0.063 4130
15		0	160 THRU 440	114S2152-31	VS90315 7075-T6	0.063 4130
16		- 5.33	160 THRU 440	114S2501-171	ALCOA 83264 7075-T6	0.050 4130
17		-10.67	160 THRU 440	114S2501-169	ALCOA 83264 7075-T6	0.050 4130
18		-16	160 THRU 440	114S2501-167	ALCOA 22878 7075-T6	0.063 4130
19		-20.67	160 THRU 440	114S2501-165	ALCOA 83264 7075-T6	0.050 4130
20		-25.34	160 THRU 440	114S2501-161	ALCOA 83264 7075-T6	0.050 4130
25		-25.34	160 THRU 440	114S2501-163	ALCOA 83264 7075-T6	0.050 4130
26		-20.67	160 THRU 440	114S2501-177	ALCOA 83264 7075-T6	0.050 4130
27		-16	160 THRU 440	114S2501-175	ALCOA 22878 7075-T6	0.063 4130
28		-10	160 THRU 440	114S2501-173	ALCOA 83264 7075-T6	0.050 4130
29		- 5.33	160 THRU 440	114S2501-173	ALCOA 83264 7075-T6	0.050 4130
30		0	160 THRU 440	114S2152-33	VS90315 7075-T6	0.063 4130
35		+29	160 THRU 440	114S2001-20	ALCOA 49225 7075-T6	0.063 4130
36		+33.54	160 THRU 440	114S2501-53	ALCOA 83264 7075-T6	0.050 4130
37		+38	190 THRU 440	114S2501-55	ALCOA 83264 7075-T6	0.050 4130
38		+42.7	160 THRU 192	114S2501-59	ALCOA 83264 7075-T6	0.050 4130
			200 THRU 429	114S2501-57	ALCOA 83264 7075-T6	0.050 4130
39	46.21	+47	160 THRU 440	114S2001-17	ALCOA 44132 7075-T6	0.100 4130
40	42.1		160 THRU 440	114S2503-67	ALCOA 28172 7075-T6	0.063 4130
41	37		200 THRU 440	114S2503-65	ALCOA 28172 7075-T6	0.063 4130
42	31.4		160 THRU 420	114S2503-248	ALCOA 28172 7075-T6	0.063 4130
43	25.72		160 THRU 440	114S2503-61	ALCOA 83264 7075-T6	0.050 4130
46	10.5		160 THRU 440	114S2503-254	VS90604 7075-T6	NOTE C.
--		+ 8.80	160 THRU 200	114S2507-41	ALCOA 22477 7075-T6	0.040 4130
--		+14.9	160 THRU 200	114S2507-41	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+21	160 THRU 200	114S2507-41	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+21	160 THRU 200	114S2507-41	ALCOA 22477 7075-T6	0.040 4130
--		+ 8.8	400 THRU 440	114S2507-43	ALCOA 23160 7075-T6	0.063 4130
--		+14.9	160 THRU 200	114S2507-45	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+14.9	240 THRU 280	114S2507-47	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+14.9	240 THRU 280	114S2507-47	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+21	240 THRU 280	114S2507-47	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+21	240 THRU 280	114S2507-47	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+ 8.80	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+ 8.80	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+14.9	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+14.9	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+21	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+21	320 THRU 360	114S2507-49	ALCOA 22477 7075-T6	0.040 4130
--		+ 8	400 THRU 440	114S2507-51	ALCOA 22477 7075-T6	0.040 4130
--		+14.9	400 THRU 440	114S2507-51	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+21	400 THRU 440	114S2507-51	ALCOA 22477 7075-T6	0.040 4130
--	(RH SIDE)	+21	400 THRU 440	114S2507-51	ALCOA 22477 7075-T6	0.040 4130
--		+14.9	400 THRU 440	114S2507-53	ALCOA 22477 7075-T6	0.040 4130
--	(LH SIDE)	+ 8.8	240 THRU 280	114S2507-91	ALCOA 59675 7075-T6	0.040 4130
--	(RH SIDE)	+ 8.8	240 THRU 280	114S2507-130	ALCOA 59675 7075-T6	0.040 4130
--		+8.8	160 THRU 200	114S2507-95	ALCOA 23160 7075-T6	0.063 4130

STIFFENERS--CABIN FUSELAGE STRUCTURE

LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
BL	WL	STATION			
	-31 THRU -42	246.5	114S2452-17	AND10133-0601 7075-T6	0.063 4130
	-31 THRU -42	253.5	114S2452-17	AND10133-0601 7075-T6	0.063 4130
	-31 THRU -42	246.5	114S2452-18	AND10133-0601 7075-T6	0.063 4130
	-31 THRU -42	253.5	114S2452-18	AND10133-0601 7075-T6	0.063 4130
	-30 THRU -41	186.5	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	193	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	306.5	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	313	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-31 THRU -41	366.5	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	373	114S2506-29	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	186.5	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	193	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	306.5	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	313	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	366.5	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	373	114S2506-30	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	206.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	213	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	226.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	233	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	286.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	293	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	386.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	393	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	406.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	413	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	426.5	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	433	114S2506-31	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	206.5	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	213	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	226.6	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	233	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	286.5	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	293	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	386.5	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	393	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	406.5	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	413	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	426.5	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -41	433	114S2506-32	ALCOA 22477 7075-T6	0.040 4130
	-30 THRU -42	326.5	114S2506-33	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	333	114S2506-33	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	346.5	114S2506-33	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	353	114S2506-33	AND10134-1005 70,5-T6	0.063 4130
	-30 THRU -42	326.5	114S2506-34	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	333	114S2506-34	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	346.5	114S2506-34	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -42	353	114S2506-34	AND10134-1005 7075-T6	0.063 4130
	-30 THRU -40	266.5	114S2506-75	AND10134-1003 7075-T6	0.063 4130
	-30 THRU -40	266.5	114S2506-76	AND10134-1003 7075-T6	0.063 4130
	-30 THRU -40	271	114S2506-95	AND10134-1003 7075-T6	0.063 4130
	-30 THRU -40	271	114S2506-96	AND10134-1003 7075-T6	0.063 4130
0		420 THRU 440	114S2611-27	VS90302 7075-T6	0.125 4130
0		400 THRU 420	114S2611-29	VS90316 7075-T6	0.125 4130
48R THRU 48L		226.5	114S2719-7	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		233.5	114S2719-7	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		285.7	114S2719-9	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		294.3	114S2719-9	0.025 7075-T6 CLAD	0.032 7075-T6
45R THRU 45L		166.5	114S2719-11	0.025 7075-T6 CLAD	0.032 7075-T6
28R THRU 48R		306.5	114S2719-13	ALCOA 83264 7075-T6	0.050 4130
28L THRU 48L		313.5	114S2719-13	ALCOA 83264 7075-T6	0.050 4130
28R THRU 48R		366.5	114S2719-13	ALCOA 83264 7075-T6	0.050 4130
28R THRU 48R		373.5	114S2719-13	ALCOA 83264 7075-T6	0.050 4130

STIFFENERS--CABIN FUSELAGE STRUCTURE

LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
BL	WL	STATION			
28L THRU 48L		306.5	114S2719-14	ALCOA 83264 7075-T6	0.050 4130
28R THRU 48R		313.5	114S2719-14	ALCOA 83264 7075-T6	0.050 4130
28L THRU 48L		366.5	114S2719-14	ALCOA 83264 7075-T6	0.050 4130
28R THRU 48R		373.5	114S2719-14	ALCOA 83264 7075-T6	0.050 4130
28R THRU 48R		326.3	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28L THRU 48L		326.3	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28R THRU 48R		332.9	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28L THRU 48L		332.9	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28R THRU 48R		346.6	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28L THRU 48L		346.6	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28R THRU 48R		352.9	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
28' THRU 48L		352.9	114S2719-15	ALCOA 55794 7075-T6	0.080 4130
0 THRU 48R		406.5	114S2719-17	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48L		413.5	114S2719-17	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48L		406.5	114S2719-18	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48R		413.5	114S2719-18	0.032 7075-T6 CLAD	0.040 7075-T6
7.2R		300 THRU 320	114S2719-21	ALCOA 83264 7075-T6	0.050 4130
20.8R		300 THRU 320	114S2719-21	ALCOA 83264 7075-T6	0.050 4130
7.2L		360 THRU 380	114S2719-21	ALCOA 83264 7075-T6	0.050 4130
20.8L		360 THRU 380	114S2719-21	ALCOA 83264 7075-T6	0.050 4130
7.2L		300 THRU 320	114S2719-22	ALCOA 83264 7075-T6	0.050 4130
20.8L		300 THRU 320	114S2719-22	ALCOA 83264 7075-T6	0.050 4130
7.2R		360 THRU 380	114S2719-22	ALCOA 83264 7075-T6	0.050 4130
13.7R		300 THRU 320	114S2719-23	AND10136-2006 7075-T6	0.125 4130
0		300 THRU 320	114S2719-23	AND10136-2006 7075-T6	0.125 4130
13.7L		300 THRU 320	114S2719-23	AND10136-2006 7075-T6	0.125 4130
0		360 THRU 380	114S2719-23	AND10136-2006 7075-T6	0.125 4130
13.7L		360 THRU 380	114S2719-23	AND10136-2006 7075-T6	0.125 4130
48R THRU 48L		246.5	114S2719-27	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		253.5	114S2719-27	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		386.5	114S2719-27	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		393.5	114S2719-27	0.025 7075-T6 CLAD	0.032 7075-T6
0 THRU 48R		426.5	114S2719-29	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48L		433.5	114S2719-29	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48L		426.5	114S2719-30	0.032 7075-T6 CLAD	0.040 7075-T6
0 THRU 48R		433.5	114S2719-30	0.032 7075-T6 CLAD	0.040 7075-T6
48R THRU 48L		266.3	114S2719-33	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		273.6	114S2719-33	0.025 7075-T6 CLAD	0.032 7075-T6
20.8R		360 THRU 380	114S2719055	ALCOA 22991 7075-T6	0.063 7075-T6
13.7R		360 THRU 380	114S2719-57	AND10136-2006 7075-T6	0.125 4130
45R THRU 45L		173.5	114S2719-63	0.025 7075-T6 CLAD	0.032 7075-T6
45R THRU 45L		185.8	114S2719-68	0.025 7075-T6 CLAD	0.032 7075-T6
45R THRU 45L		193.1	114S2719-69	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		206.5	114S2719-70	0.025 7075-T6 CLAD	0.032 7075-T6
48R THRU 48L		213.5	114S2719-71	0.025 7075-T6 CLAD	0.032 7075-T6

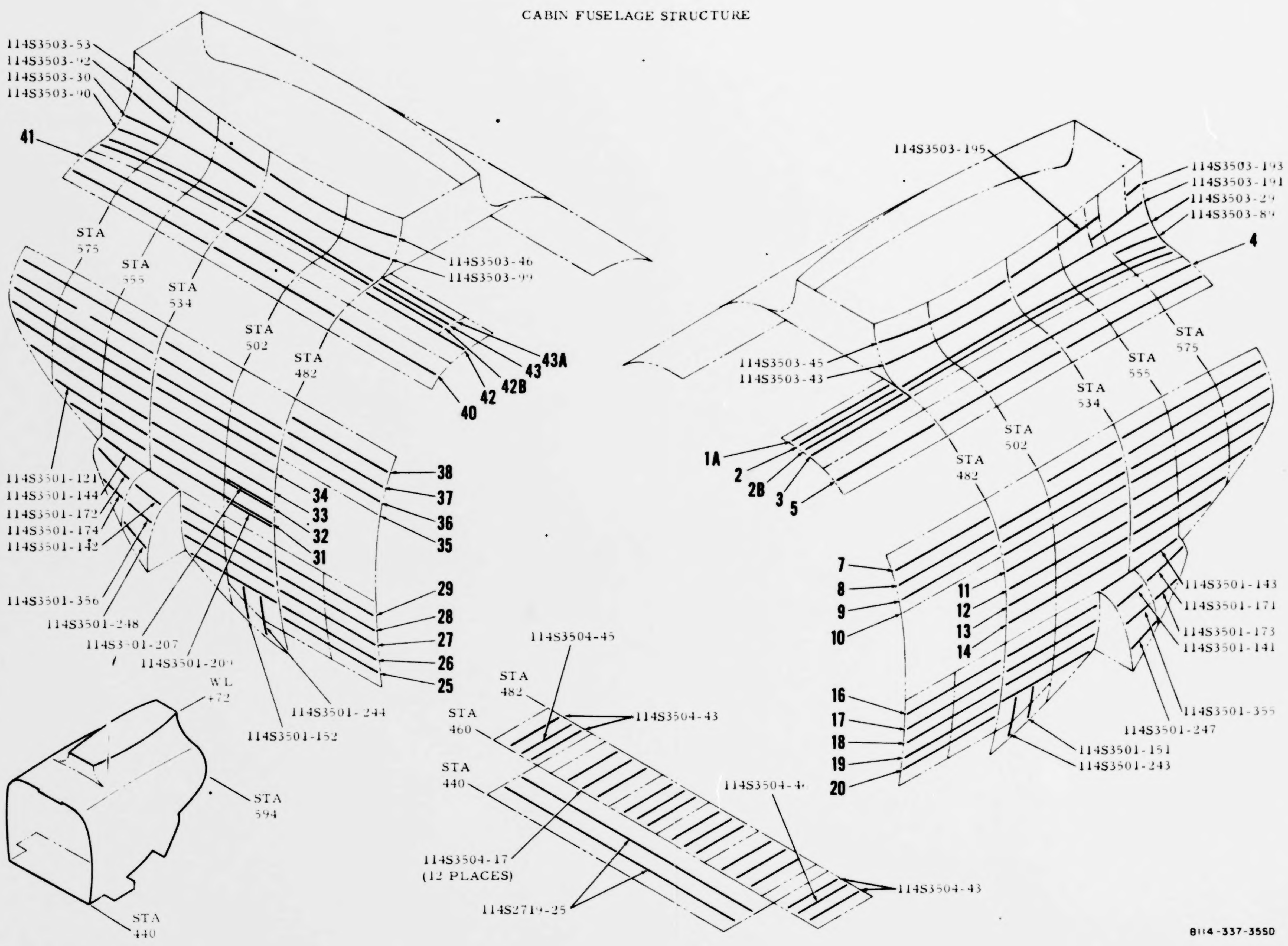
⧄ USED ON HELICOPTERS, 66-19098 THRU 67-18445
⧅ USED ON HELICOPTERS, 67-18446 AND SUBSEQUENT

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. UNNUMBERED STRINGERS AND ALL STIFFENERS ARE IDENTIFIED BY PART NUMBER
C. REPLACE WITH A SECTION CORRESPONDING TO THE ORIGINAL

B114 336 345M

FO-2. Stringer and Stiffener Identification (Sheet 5 of 9)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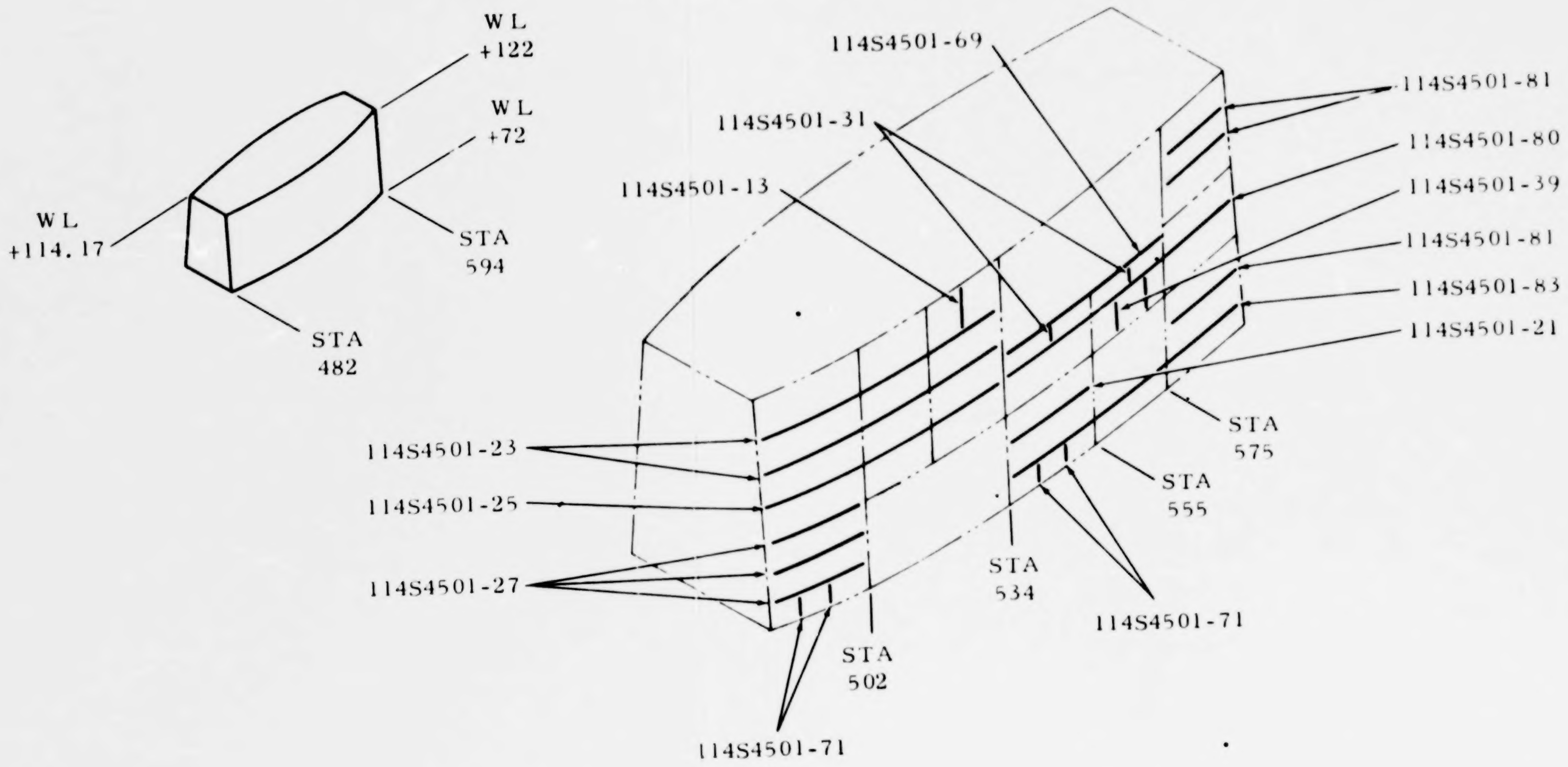
FO-2. Stringer and Stiffener Identification (Sheet 6 of 9)

AFT PYLON STRUCTURE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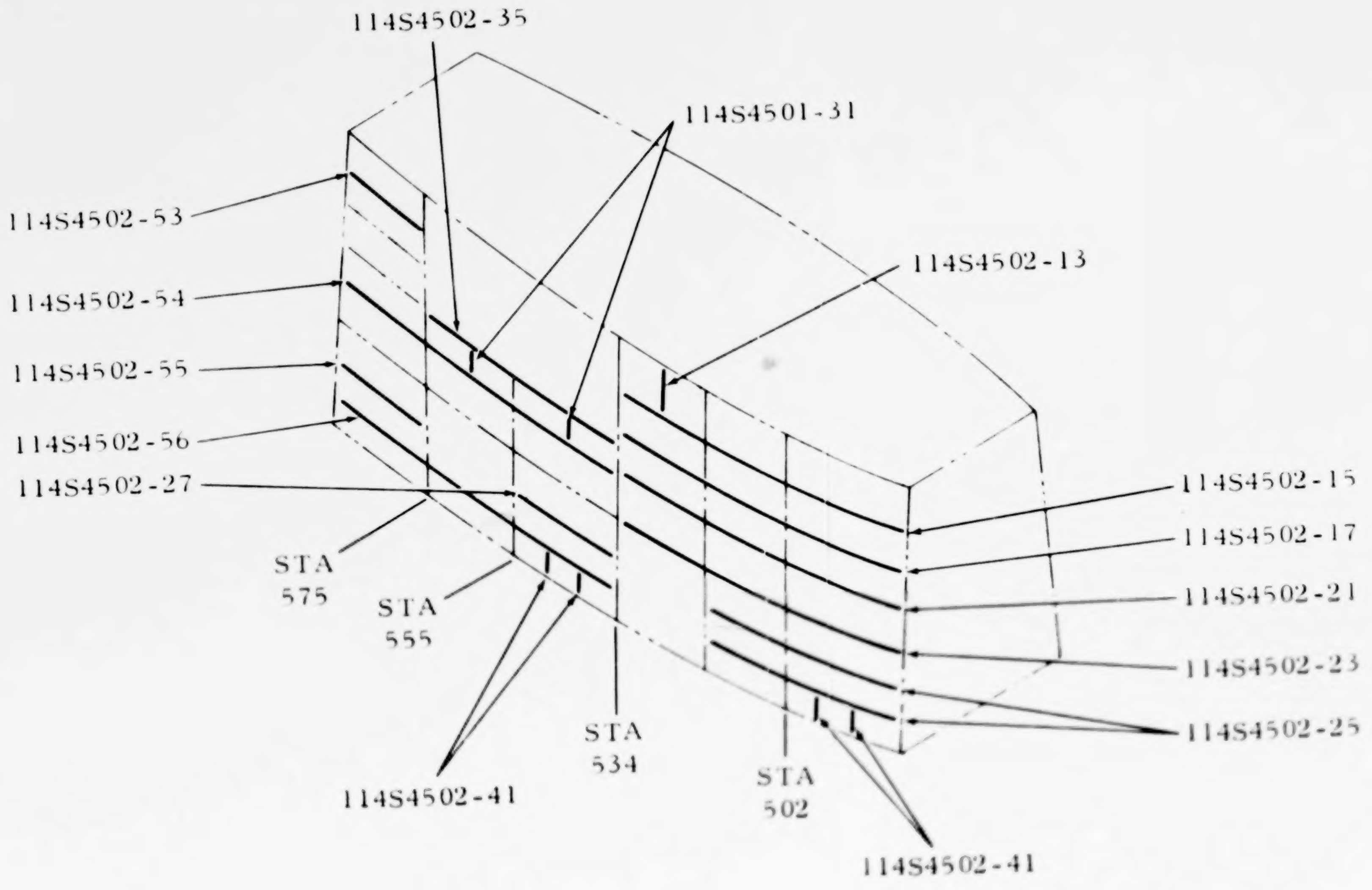
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534
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502
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114S4502-17
114S4502-21
114S4502-23
114S4502-25

B114-339-35SD

FO-2. Stringer and Stiffener Identification (Sheet 8 of 9)

STRINGERS--AFT PYLON STRUCTURE

STRINGER NO. (NOTE B.)	LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
	BL	WL	STATION			
--		+ 84.5	534 THRU 555.3	114S4501-21	VS70503-1 7075-T6	0.032 7075-T6
--		+103.25	482 THRU 534	114S4501-23	VS70503-1 7075-T6	0.032 7075-T6
--		+109.5	482 THRU 534	114S4501-23	VS70503-1 7075-T6	0.032 7075-T6
--		+ 97	482 THRU 534	114S4501-25	VS70503-3 7075-T6	0.050 7075-T6
--		+ 78.25	482 THRU 502.4	114S4501-27	VS70503-1 7075-T6	0.032 7075-T6
--		+ 84.5	482 THRU 502.4	114S4501-27	VS70503-1 7075-T6	0.032 7075-T6
--		+ 90.75	482 THRU 502.4	114S4501-27	VS70503-1 7075-T6	0.032 7075-T6
--		+100	534 THRU 575.5	114S4501-69	HARVEY 15078 7075-T6	0.063 4130
--		+ 97	534 THRU 594	114S4501-80	0.063 7075-T6 BARE	0.071 7075-T6 BARE
--		+ 84.5	575 THRU 594	114S4501-81	ALCOA 83264 7075-T6	0.050 4130
--		+109.5	575 THRU 594	114S4501-81	ALCOA 83264 7075-T6	0.050 4130
--		+115.75	575 THRU 594	114S4501-81	ALCOA 83264 7075-T6	0.050 4130
--		+ 78.25	534 THRU 594	114S4501-83	BAC1517-1523 7075-T6	0.050 7075-T6
--		+109.5	482 THRU 534	114S4502-15	VS70503-1 7075-T6	0.032 7075-T6
--		+103.25	482 THRU 534	114S4502-17	VS70503-1 7075-T6	0.032 7075-T6
--		+ 97	482 THRU 534	114S4502-21	VS70503-3 7075-T6	0.050 7075-T6
--		+ 90.75	482 THRU 534	114S4502-23	ALCOA 22477 7075-T6	0.040 4130
--		+ 78.25	482 THRU 518	114S4502-25	VS70503-1 7075-T6	0.032 7075-T6
--		+ 84.5	482 THRU 518	114S4502-25	VS70503-1 7075-T6	0.032 7075-T6
--		+ 84.5	534 THRU 555.3	114S4502-27	VS70503-1 7075-T6	0.032 7075-T6
--		+100	534 THRU 575.5	114S4502-35	HARVEY 15078 7075-T6	0.063 4130
--		+115.75	575.5 THRU 594	114S4502-53	HARVEY 15152 7075-T6	0.032 4130
--		+ 97	534 THRU 594	114S4502-54	0.063 7075-T6 BARE	0.071 7075-T6 BARE
--		+ 84.5	575.5 THRU 594	114S4502-55	ALCOA 83264 7075-T6	0.050 4130
--		+ 78.25	534 THRU 594	114S4502-56	BAC1517-1523 7075-T6	0.050 7075-T6

STIFFENERS--AFT PYLON STRUCTURE

LOCATION			PART NO.	ORIGINAL MATERIAL	REPAIR MATERIAL
BL	WL	STATION			
	+109 THRU +116	526	114S4501-13	ALCOA 67580 7075-T6	0.050 4130
(LH SIDE)	+ 97 THRU +100	544.5	114S4501-31	ALCOA 22477 7075-T6	0.040 4130
(LH SIDE)	+ 97 THRU +100	564	114S4501-31	ALCOA 22477 7075-T6	0.040 4130
(RH SIDE)	+ 97 THRU +100	544.5	114S4501-31	ALCOA 22477 7075-T6	0.040 4130
(RH SIDE)	+ 97 THRU +100	564	114S4501-31	ALCOA 22477 7075-T6	0.040 4130
	+ 90 THRU + 97	561	114S4501-39	VS70504-4 7075-T6	0.040 7075-T6
	+ 90 THRU + 97	571	114S4501-39	VS70504-4 7075-T6	0.040 7075-T6
	+ 72 THRU + 78	488.7	114S4501-71	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	494.7	114S4501-71	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	540.4	114S4501-71	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	547.9	114S4501-71	ALCOA 22477 7075-T6	0.040 4130
	+109 THRU +116	526	114S4502-13	ALCOA 67580 7075-T6	0.050 4130
	+ 72 THRU + 78	488.7	114S4502-41	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	494.7	114S4502-41	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	540.4	114S4502-41	ALCOA 22477 7075-T6	0.040 4130
	+ 72 THRU + 78	547.9	114S4502-41	ALCOA 22477 7075-T6	0.040 4130

NOTES

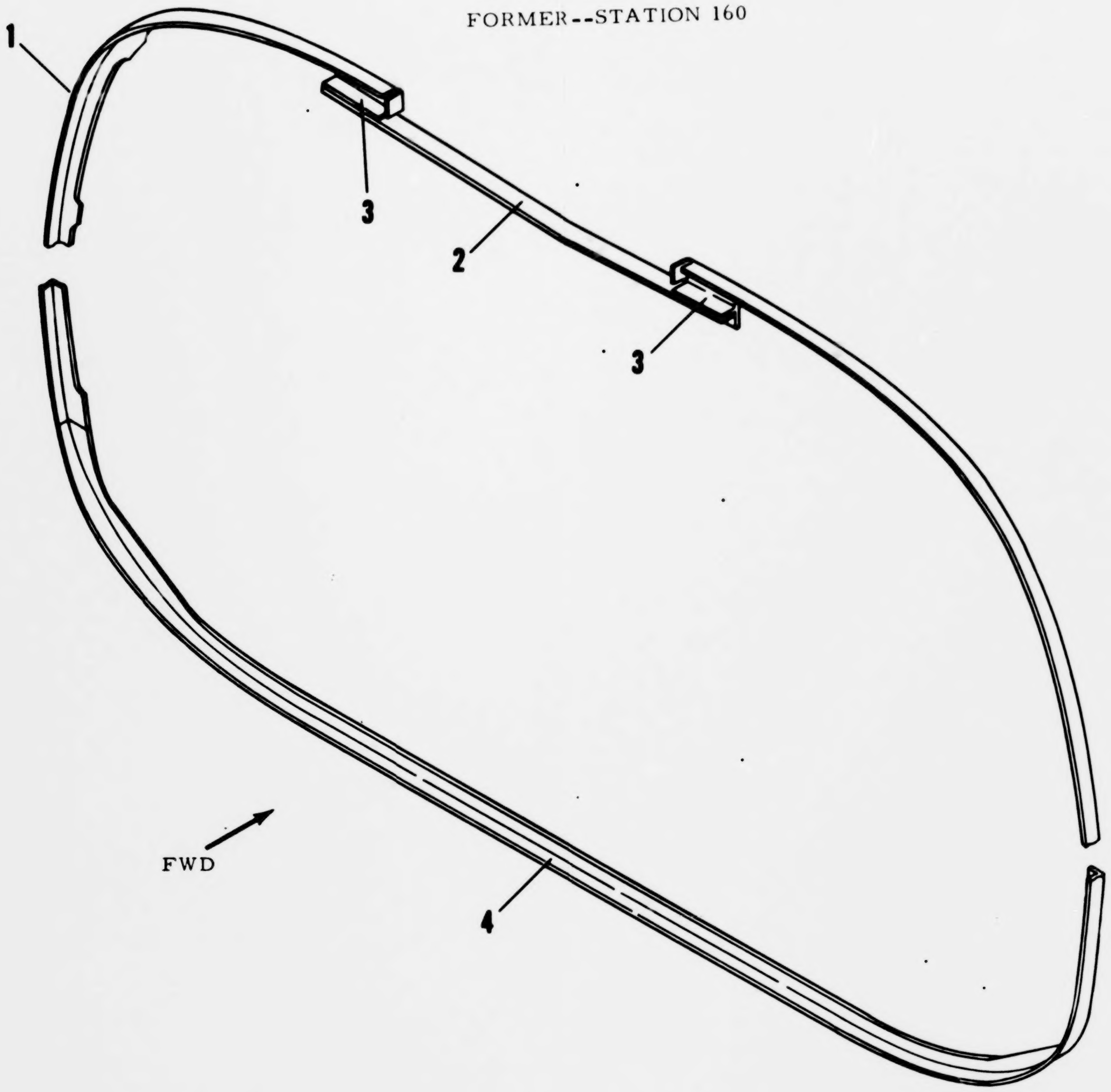
A. ALL DIMENSIONS ARE IN INCHES

B. UNNUMBERED STRINGERS AND ALL STIFFENERS ARE IDENTIFIED BY PART NUMBER

B114-340-34S

FO-2. Stringer and Stiffener Identification (Sheet 9 of 9)

FORMER--STATION 160



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CAP	ALCOA 59195 7075-T6	0.071 4130
2	CAP	ALCOA 30934 7075-T6	0.071 4130
3	ANGLE	0.063 7075-T6 BARE	0.063 7075-T6 CLAD
4	CAP	VS90110 7075-T6	0.090 4130

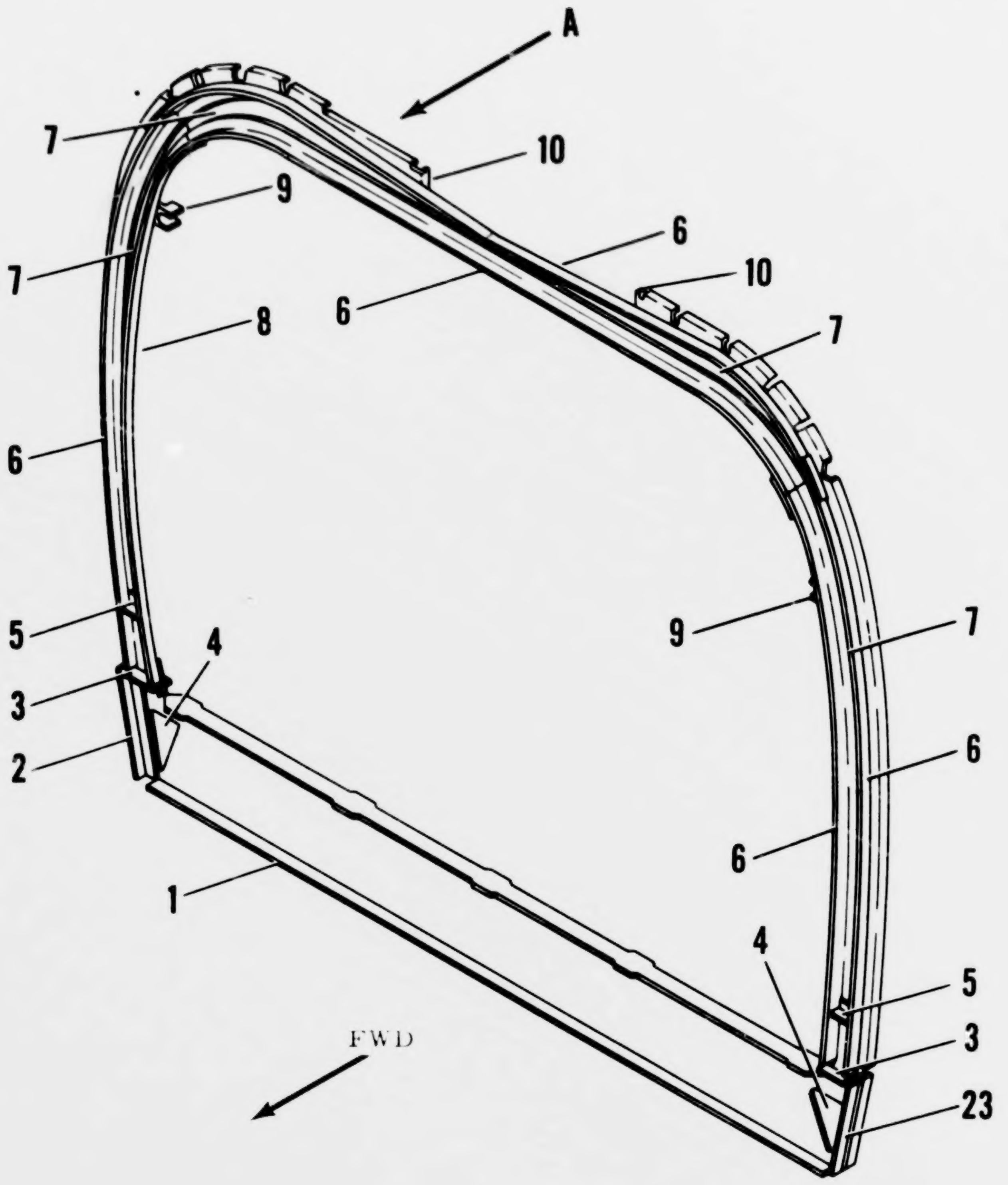
NOTES

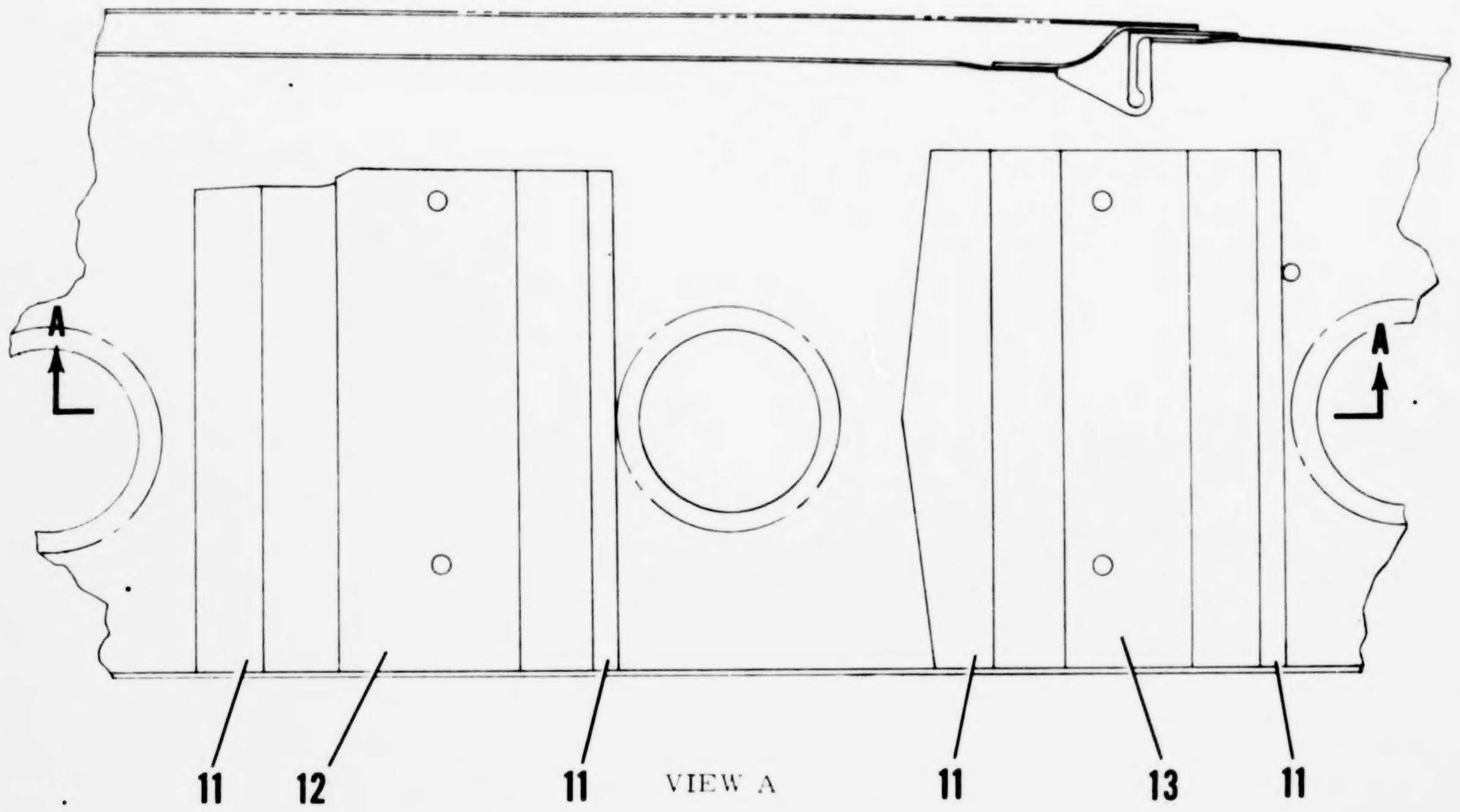
A. ALL DIMENSIONS ARE IN INCHES

B114-111-34S

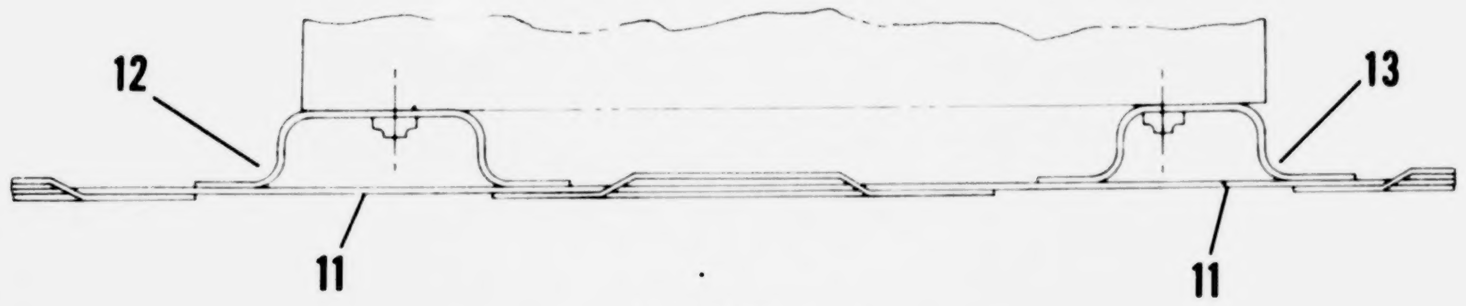
FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 1 of 10)

FORMER--STATION 200





VIEW A



SECTION A-A

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	BONDED ASSEMBLY	0.255, 3.0-3/8-20N-3003	NOTE B.	2-7
2	ANGLE	AND10133-0601 7075-T6	0.071 4130	2-11
3	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-7
4	FITTING	0.250 7075-T6 BARE	NOTE C.	- -
5	STIFFENER	ALCOA 30670 7075-T6	0.125 4130	2-11
6	CAP	0.125 4130	0.160 4130	2-11
7	WEB	0.050 2024-T4 CLAD	0.063 2024-T3 CLAD	2-7
8	CAP	REYNOLDS 6033 6075-T6	0.125 4130	2-11
9	FITTING	2014-T6	NOTE D.	- -
10	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	2-7
11	DOUBLER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
12	BRACKET	0.063 2024-T3 BARE	NOTE E.	- -
13	BRACKET	0.063 2024-T3 BARE	NOTE E.	- -

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. THE BONDED ASSEMBLY IS OF SANDWICH HONEYCOMB CONSTRUCTION. REFER TO PARA 18-912 FOR TYPICAL REPAIRS

C. INTEGRAL PART OF THE BONDED ASSEMBLY DAMAGE OTHER THAN NEGLIGIBLE NECESSITATES REPLACEMENT OF THE BONDED ASSEMBLY

D. REPLACE WITH NEW FITTING 114S2836-1 LH OR -2 RH IF DAMAGE IS GREATER THAN NEGLIGIBLE

E. REPLACE BRACKET (12) WITH BRACKET 114S2303-48
REPLACE BRACKET (13) WITH BRACKET 114S2303-50

F/Ox54

B114 112 34

FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 2 of 10)

FORMER--STATION 240

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BONDED ASSEMBLY	0.405, 3.0-3/8-20N-3003	NOTE B.
2	ANGLE	AND10133-1404 7075-T6	0.190 4130
3	ANGLE	AND10133-1404 7075-T6	0.190 4130
4	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
5	FITTING	7075-T6 FORGING	NOTE C.
6	CAP	AND10134-1407 7075-T6	0.160 4130
7	CAP	REYNOLDS 7825 7075-T6	0.190 4130
8	CAP	VS90115 7075-T6	0.125 4130
9	CAP	VS90115 7075-T6	0.125 4130
10	WEB	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD
11	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
12	FITTING	2014-T6	NOTE D.
13	STIFFENER	ALCOA 22477 7075-T6	0.050 4130
14	CAP	AND10133-0601 7075-T6	0.071 4130
15	WEB	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
16	CAP	AND10135-1002 7075-T6	0.071 4130
17	STIFFENER	ALCOA 22477 7075-T6	0.050 4130
18	FITTING	2014-T6	NOTE D.
19	WEB	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
20	CAP	VS90115 7075-T6	0.125 4130
21	WEB	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD
22	CAP	VS90115 7075-T6	0.125 4130
23	CAP	REYNOLDS 7825 7075-T6	0.190 4130
24	CAP	AND10134-1407 7075-T6	0.160 4130
25	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD
26	ANGLE	AND10133-1404 7075-T6	0.190 4130
27	FITTING	7075-T6 FORGING	NOTE C.
28	ANGLE	AND10133-1404 7075-T6	0.190 4130
29	STRAP	0.090 7075-T6 BARE	0.090 4130

NOTES

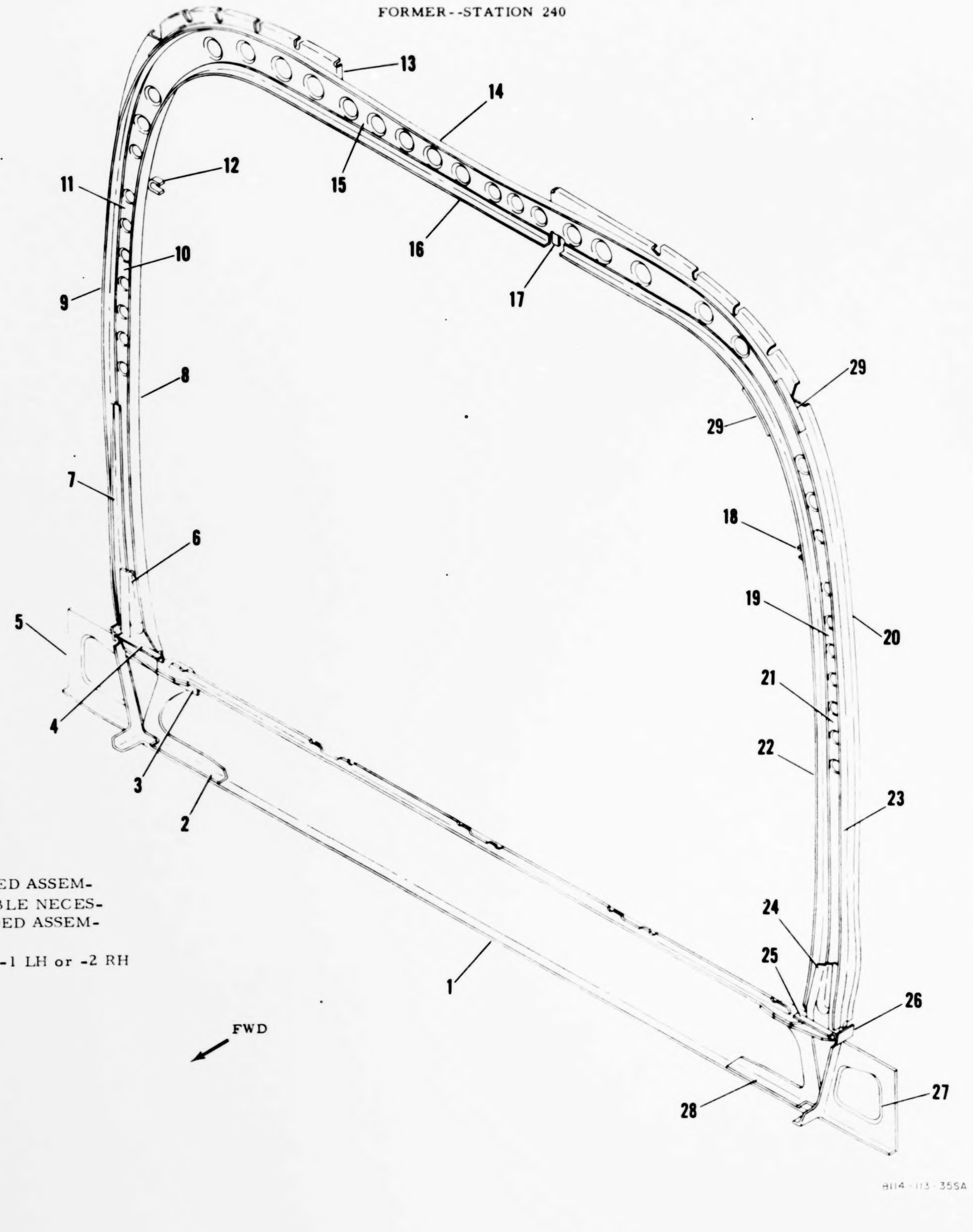
A. ALL DIMENSIONS ARE IN INCHES

B. THE BONDED ASSEMBLY IS OF SANDWICH HONEYCOMB CONSTRUCTION.

C. THE FITTING IS A PART OF THE BONDED ASSEMBLY. DAMAGE OTHER THAN NEGLIGIBLE NECESSITATES REPLACEMENT OF THE BONDED ASSEMBLY

D. REPLACE WITH NEW FITTING 114S2836-1 LH or -2 RH

FORMER--STATION 240



FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 3 of 10)

FORMER--STATION 280

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BONDED ASSEMBLY	0.255, 3.0-3/8-20N-3003	NOTE B
3	ANGLE	AND10133-0601 7075-T6	0.071 4130
4	ANGLE	0.040 7075-T6 CLAD	0.063 7075-T6 CLAD
5	FITTING	0.250 7075-T6 BARE	NOTE C
6	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
7	WEB	0.050 2024-T42CLAD	0.063 2024-T3 CLAD
8	CAP	0.125 4130	0.160 4130
9	CAP	0.125 4130	0.160 4130
10	FITTING	2014-T6	NOTE D
11	STIFFENER	ALCOA 22477 7075-T6	0.050 4130
12	CAP	0.125 4130	0.160 4130
13	CAP	0.125 4130	0.160 4130
14	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
15	STIFFENER	ALCOA 22990 7075-T6	0.071 4130
16	FITTING	2014-T6	NOTE D
17	CAP	0.125 4130	0.160 4130
18	CAP	0.125 4130	0.160 4130
19	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
20	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
21	ANGLE	0.040 7075-T6 CLAD	0.063 7075-T6 CLAD
22	FITTING	0.250 7075-T6 BARE	NOTE C
23	ANGLE	AND10133-0601 7075-T6	0.071 4130

FORMER--STATION 320

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	BONDED ASSEMBLY	0.405, 3.0-3/8-20N-3003	NOTE B
2	ANGLE	ALCOA 27778 7075-T6	0.100 4130
3	ANGLE	AND10133-0601 7075-T6	0.071 4130
4	ANGLE	0.040 7075-T6 BARE	0.063 7075-T6 CLAD
5	FITTING	0.400 7075-T6 BARE	NOTE C
6	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
7	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
8	CAP	0.125 4130	0.160 4130
9	CAP	0.125 4130	0.160 4130
		7075-T6	
10	FITTING	2014-T6	NOTE D
11	STIFFENER	ALCOA 22477 7075-T6	0.050 4130
12	CAP	0.125 4130	0.160 4130
13	CAP	0.125 4130	0.160 4130
14	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
15	STIFFENER	ALCOA 22990 7075-T6	0.071 4130
16	FITTING	2014-T6	NOTE D
17	CAP	0.125 4130	0.160 4130
18	CAP	0.125 4130	0.160 4130
19	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
20	WEB	0.050 2024-T42 CLAD	0.063 2024-T3 CLAD
21	ANGLE	0.040 7075-T6 BARE	0.063 7075-T6 CLAD
22	FITTING	0.400 7075-T6 PLATE	NOTE C
23	ANGLE	AND10133-0601 7075-T6	0.071 4130
24	ANGLE	ALCOA 27778 7075-T6	0.100 4130

NOTES

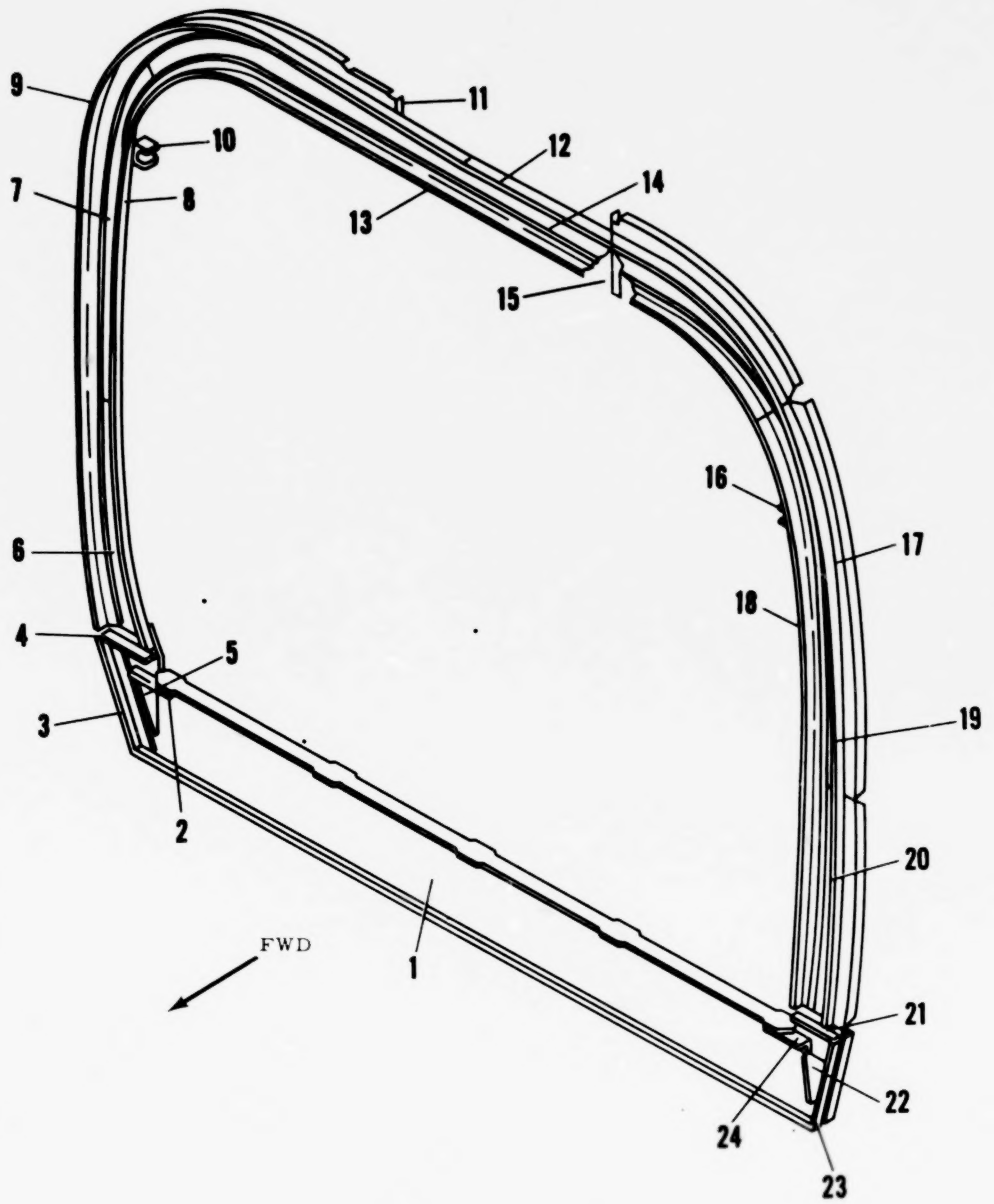
A. ALL DIMENSIONS ARE IN INCHES

B. THE BONDED ASSEMBLY IS OF SANDWICH HONEYCOMB CONSTRUCTION.

C. INTEGRAL PART OF BONDED ASSEMBLY. DAMAGE OTHER THAN NEGLIGIBLE NECESSITATES REPLACEMENT OF BONDED ASSEMBLY

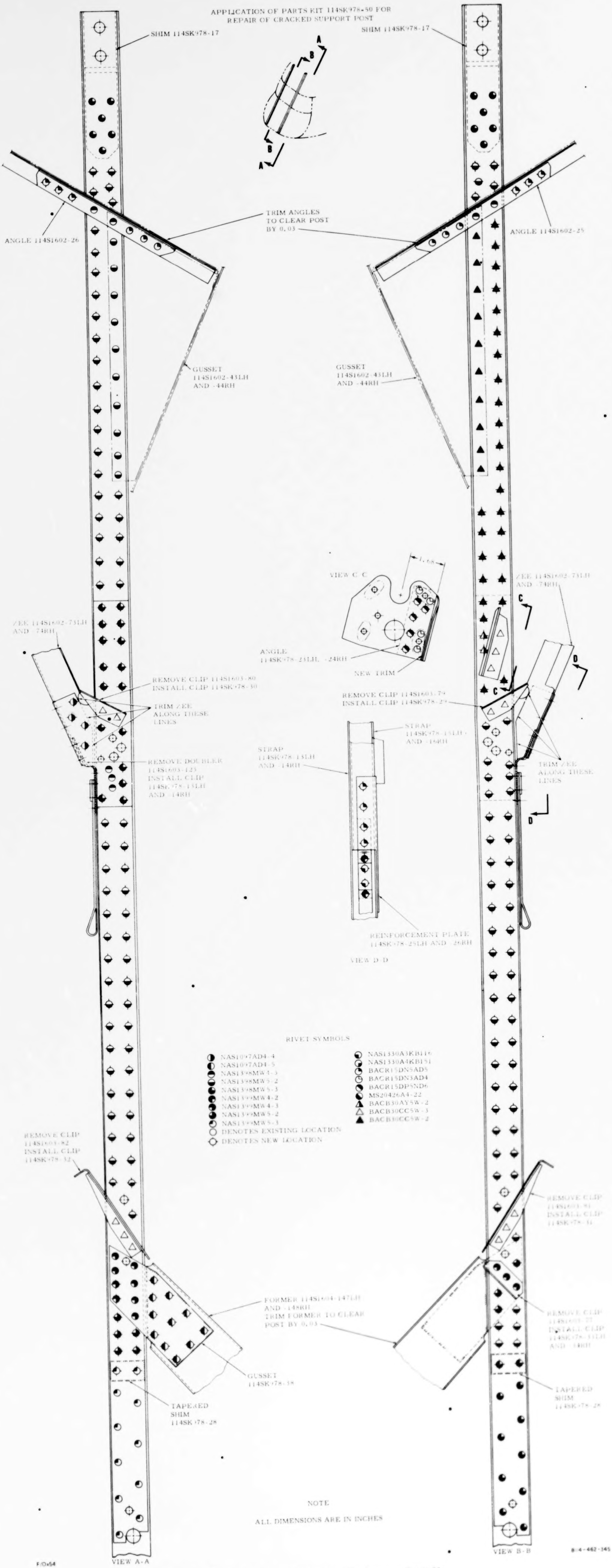
D. REPLACE WITH NEW FITTING 114S2830-11 LH OR -12 RH IF DAMAGE IS GREATER THAN NEGLIGIBLE

FORMERS -- STATIONS 280 AND 320



B114 115-345

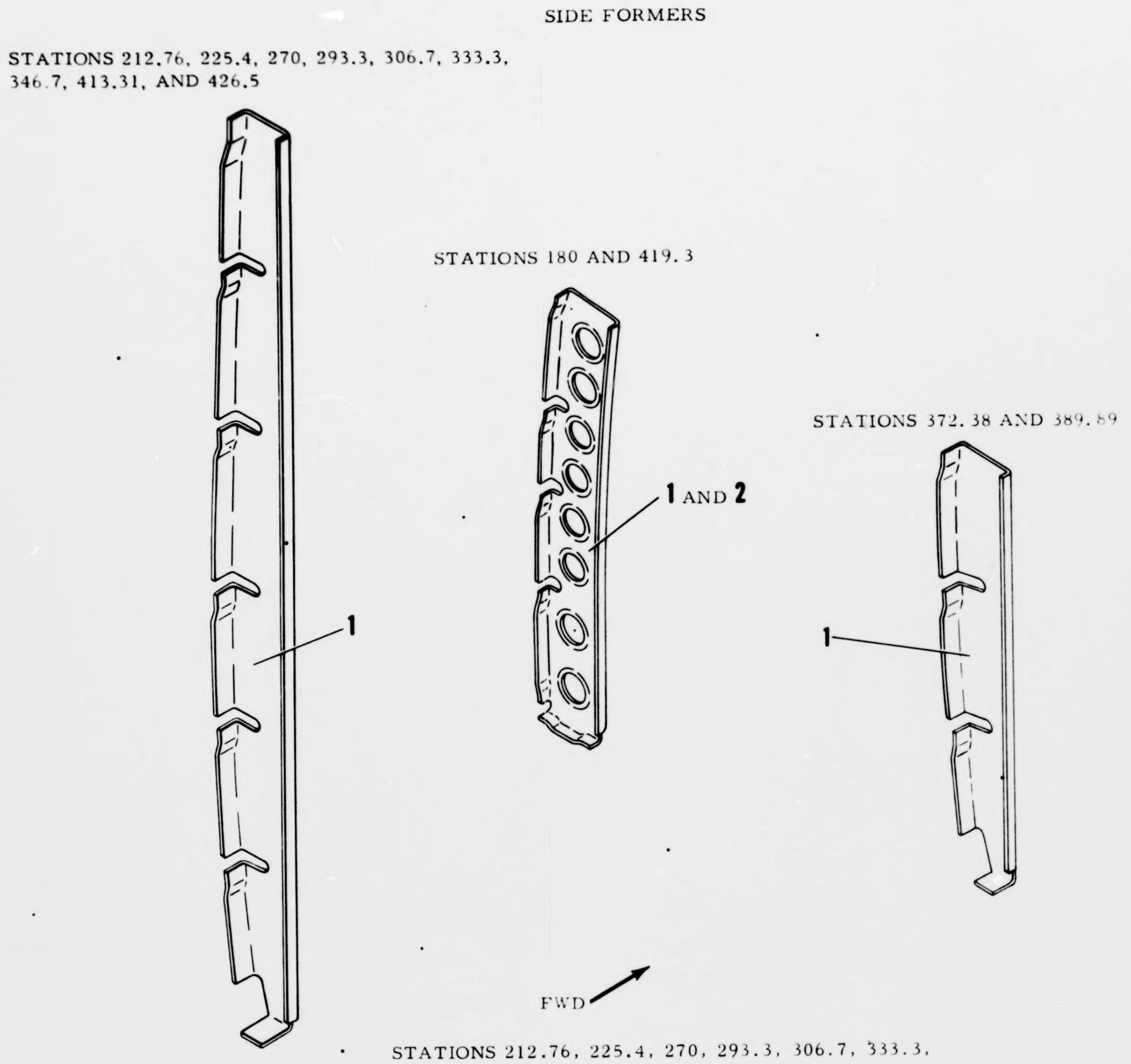
FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 4 of 10)


APPLICATION OF PARTS KIT 114SK978-50 FOR
REPAIR OF CRACKED SUPPORT POST
SHIM 114SK978-17
SHIM 114SK978-17
A
B
B
A
TRIM ANGLES
TO CLEAR POST
BY 0.03
ANGLE 114S1602-26
ANGLE 114S1602-25
GUSSET
114S1602-43LH
AND -44RH
GUSSET
114S1602-43LH
AND -44RH
VIEW C-C
1.68
ANGLE
114SK978-23LH, -24RH
NEW TRIM
ZEE 114S1602-73LH
AND -74RH
ZEE 114S1602-73LH
AND -74RH
C
C
D
D
REMOVE CLIP 114S1603-80
INSTALL CLIP 114SK978-30
TRIM ZEE
ALONG THESE
LINES
REMOVE DOUBLER
114S1603-123
INSTALL CLIP
114SK978-13LH
AND -14RH
REMOVE CLIP 114S1603-79
INSTALL CLIP 114SK978-29
STRAP
114SK978-15LH
AND -16RH
STRAP
114SK978-13LH
AND -14RH
TRIM ZEE
ALONG THESE
LINES
REINFORCEMENT PLATE
114SK978-25LH AND -26RH
VIEW D-D
RIVET SYMBOLS
◑ NAS1097AD4-4
◐ NAS1097AD4-5
⊖ NAS1398MW4-3
⊖ NAS1398MW5-2
● NAS1398MW5-3
● NAS1399MW4-2
● NAS1399MW4-3
● NAS1399MW5-2
◔ NAS1399MW5-3
○ DENOTES EXISTING LOCATION
⊕ DENOTES NEW LOCATION
◕ NAS1330A3KB116
◕ NAS1330A4KB151
◔ BACR15DN5AD5
◔ BACR15DN3AD4
● BACR15DP5ND6
● MS20426A4-22
▲ BACB30AY5W-2
△ BACB30CC5W-3
▲ BACB30CC5W-2
REMOVE CLIP
114S1603-82
INSTALL CLIP
114SK978-32
REMOVE CLIP
114S1603-81
INSTALL CLIP
114SK978-31
FORMER 114S1604-147LH
AND -148RH
TRIM FORMER TO CLEAR
POST BY 0.03
GUSSET
114SK978-38
REMOVE CLIP
114S1603-77
INSTALL CLIP
114SK978-33LH
AND -34RH
TAPERED
SHIM
114SK978-28
TAPERED
SHIM
114SK978-28
VIEW A-A
VIEW B-B
F/Ox54
B-4-462-345

NOTE

ALL DIMENSIONS ARE IN INCHES

FO-5. Enclosure Repairs — Cockpit Fuselage Structure Assembly
Center Support Posts


SIDE FORMERS
STATIONS 212.76, 225.4, 270, 293.3, 306.7, 333.3, 346.7, 413.31, AND 426.5
1
STATIONS 180 AND 419.3
1 AND 2
STATIONS 372.38 AND 389.89
1
FWD

STATIONS 212.76, 225.4, 270, 293.3, 306.7, 333.3, 346.7, 372.38, 389.89, 413.31, 419.3, AND 426.5

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	FORMER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD

STATION 180

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
2	FORMER	0.025 2024-T4	0.032 2024-T3

NOTES

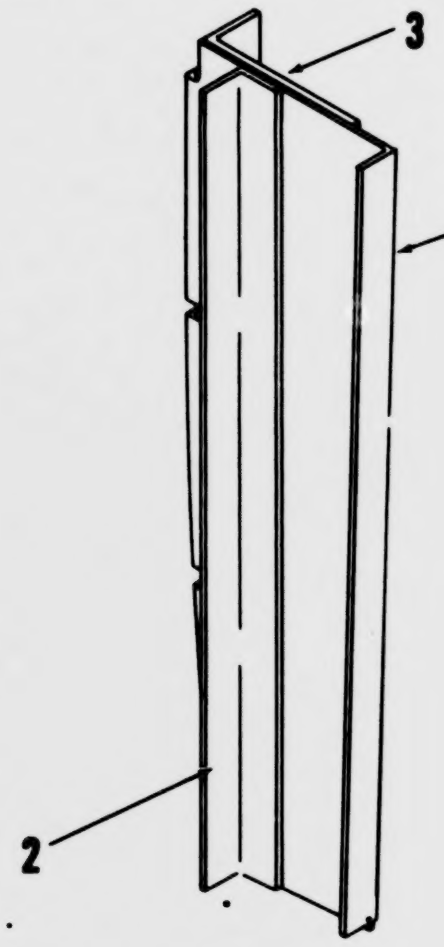
A. ALL DIMENSIONS ARE IN INCHES
B. THE LH FORMERS ARE SHOWN. THE RH FORMERS ARE SIMILAR IN CONSTRUCTION. THE ORIGINAL AND REPAIR MATERIALS ARE APPLICABLE TO LH AND RH CONFIGURATIONS

B114-119-3

FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 6 of 10)

SIDE FORMERS

STATIONS 189.35, 238.06, 262.10, AND 372.42



NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. THE LH FORMERS ARE SHOWN. THE RH FORMERS ARE SIMILAR IN CONSTRUCTION. THE ORIGINAL AND REPAIR MATERIALS ARE APPLICABLE TO LH AND RH CONFIGURATIONS
C. REPLACE WITH NEW FITTING 114S2857-1 LH OR -2 RH

STATIONS 189.35, 238.06, 262.10, AND 372.42

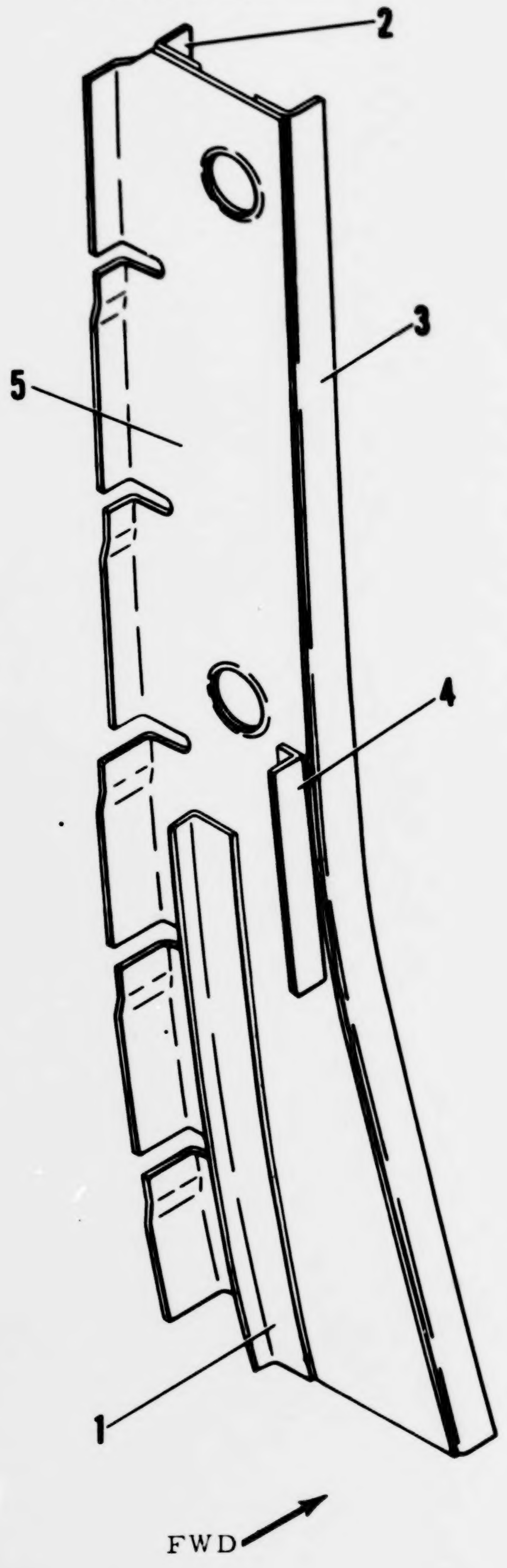
INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	FORMER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD
2	ANGLE	AND10134-0702 2024	0.071 4130
3	TENSION FITTING	--	NOTE C.

B114-300-34S

FO-3. *Former Repairs—Cabin Fuselage Structure Assembly (Sheet 7 of 10)*

STATION 260

PARTIAL FORMERS



NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. THE LH FORMER IS SHOWN. THE RH FORMER IS SIMILAR IN CONSTRUCTION. ORIGINAL AND REPAIR MATERIALS ARE APPLICABLE TO BOTH
C. REPLACE WITH NEW SUPPORT 114S2106-19 LH OR -20 RH

STATION 260

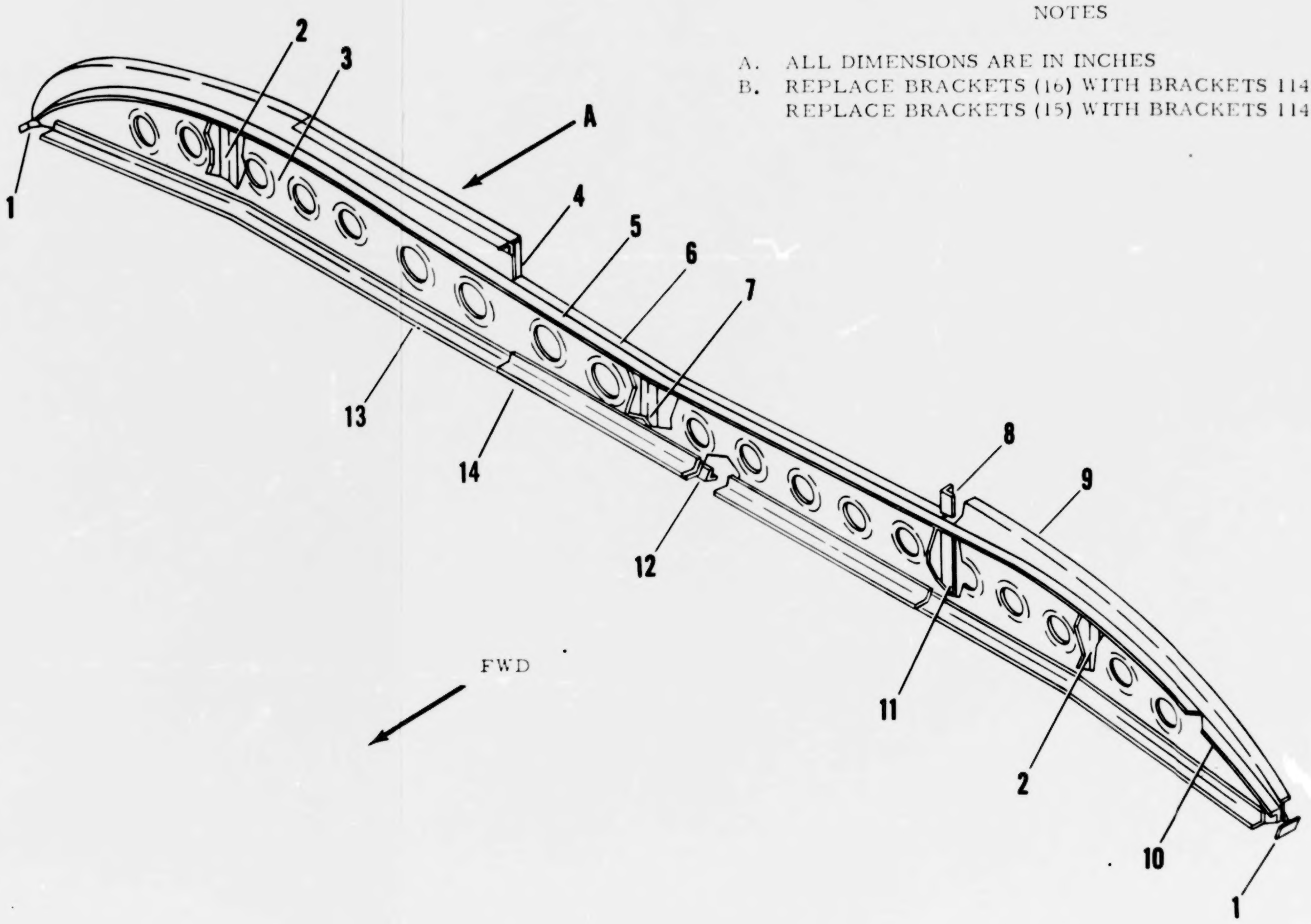
INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CAP	HARVEY 11301-3 7075-T6	0.125 4130
2	CAP	HARVEY 16119 7075-T6	0.160 4130
3	CAP	REYNOLDS 19273 7075-T6	0.080 4130
4	SUPPORT	ALCOA 62564 7075-T6	NOTE C.
5	WEB	0.040 7075-T6 CLAD	0.050 7075-T6 CLAD

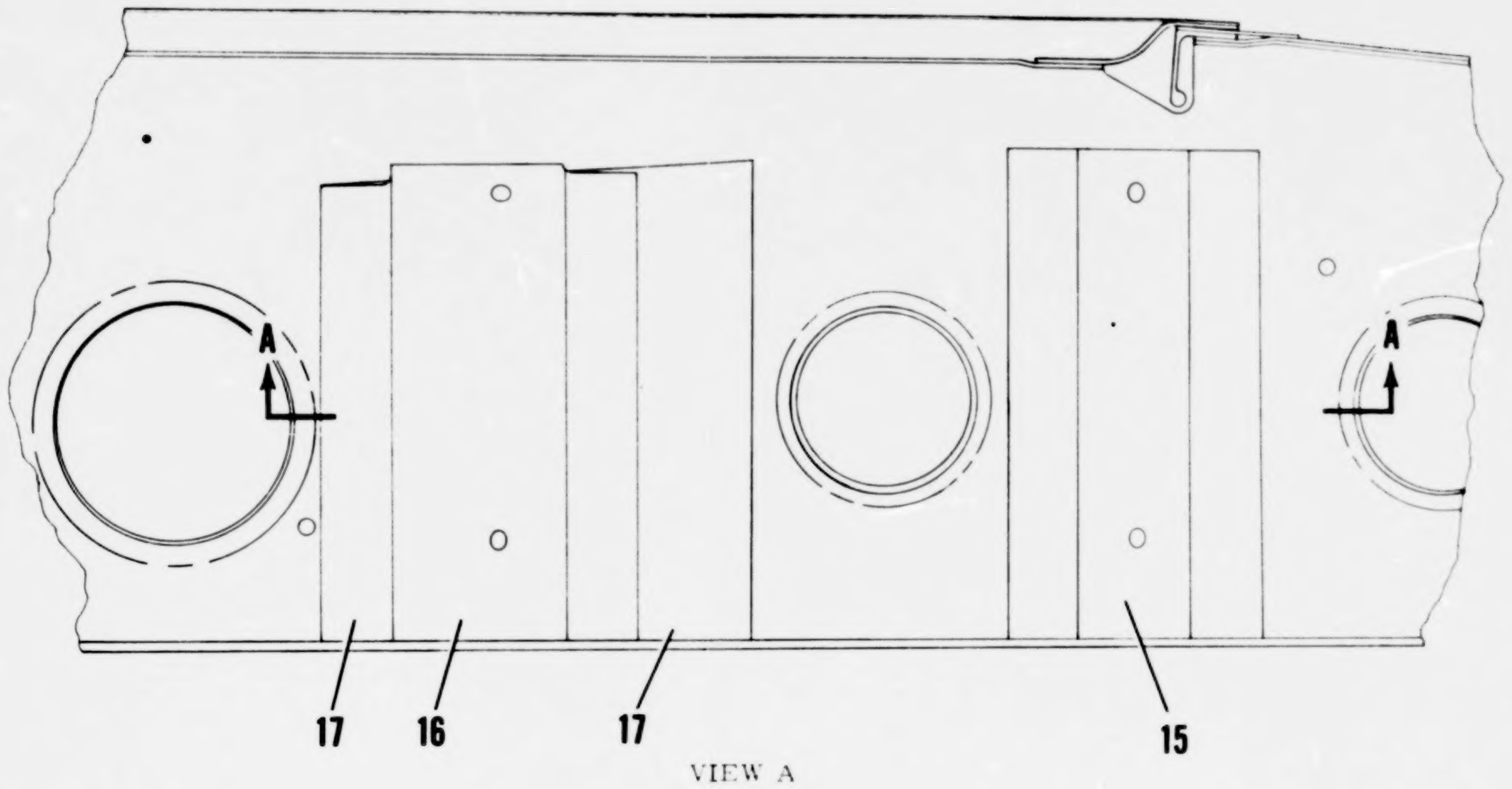
FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 8 of 10)

CROWN FORMERS--STA 180, 220, 260, 300, 340, 380, AND 420

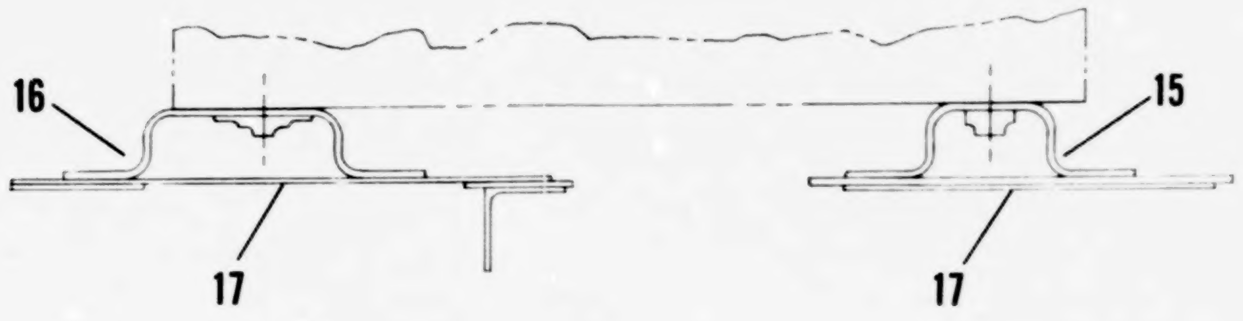
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REPLACE BRACKETS (16) WITH BRACKETS 114S2302-60
REPLACE BRACKETS (15) WITH BRACKETS 114S2302-62





VIEW A



SECTION A-A

STATION 180

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CLIP	ALCOA 52966 7075-T6	0.090 4130	- -
2	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	2-11
3 □	WEB	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
△	WEB	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD	2-7
4	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	2-11
5	CAP	ALCOA 15820 7075-T6	0.080 4130	2-11
7	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	2-11
10	CAP	ALCOA 15820 7075-T6	0.080 4130	2-11
11	STIFFENER	ALCOA 22477 7075-T6	0.050 4130	2-11
13	CAP	ALCOA 67580 7075-T6	0.063 4130	2-11
15	BRACKET	0.063 2024-T3	NOTE B.	- -
16	BRACKET	0.063 2024-T3	NOTE B.	- -
17	DOUBLER	0.040 2024-T3 BARE	0.050 2024-T3 CLAD	2-7

□ USED ON HELICOPTERS, 66-19098 THROUGH 68-15856
△ USED ON HELICOPTERS, 68-15857 AND SUBSEQUENT

B114-121-3458

FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 9 of 10)

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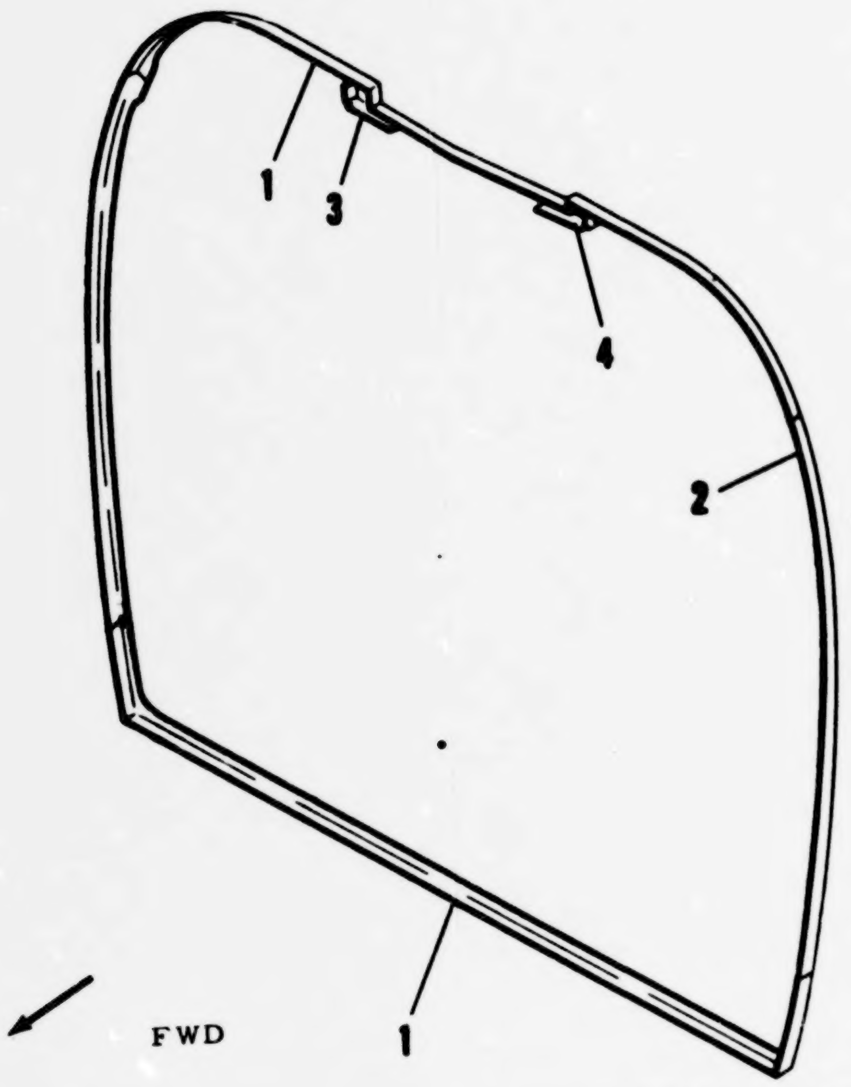
FORMER--STATION 440



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	CAP	VS90110 7075-T6	0.090 4130	2-11
2	ANGLE	0.040 7075-T6 BARE	0.050 7075-T6 CLAD	2-63
3	GUSSET	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	2-7
4	GUSSET	0.063 2024-T4 CLAD	0.063 2024-T3 CLAD	2-63

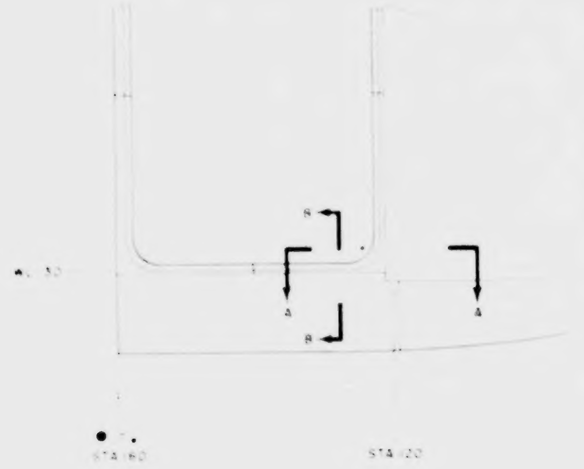
NOTE

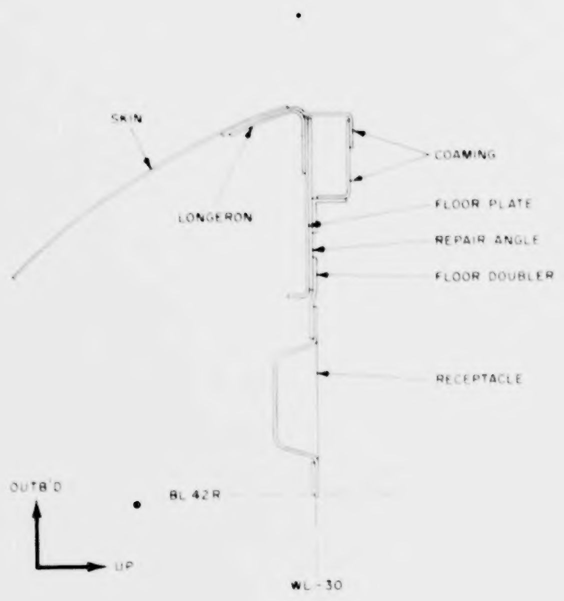
ALL DIMENSIONS ARE IN INCHES

B114 123 34S

42x40

FO-3. Former Repairs—Cabin Fuselage Structure Assembly (Sheet 10 of 10)


B
A
A
B
WL -30
STA 160
STA 120


SKIN
LONGERON
COAMING
FLOOR PLATE
REPAIR ANGLE
FLOOR DOUBLER
RECEPTACLE
OUTB'D
UP
BL 42R
WL -30

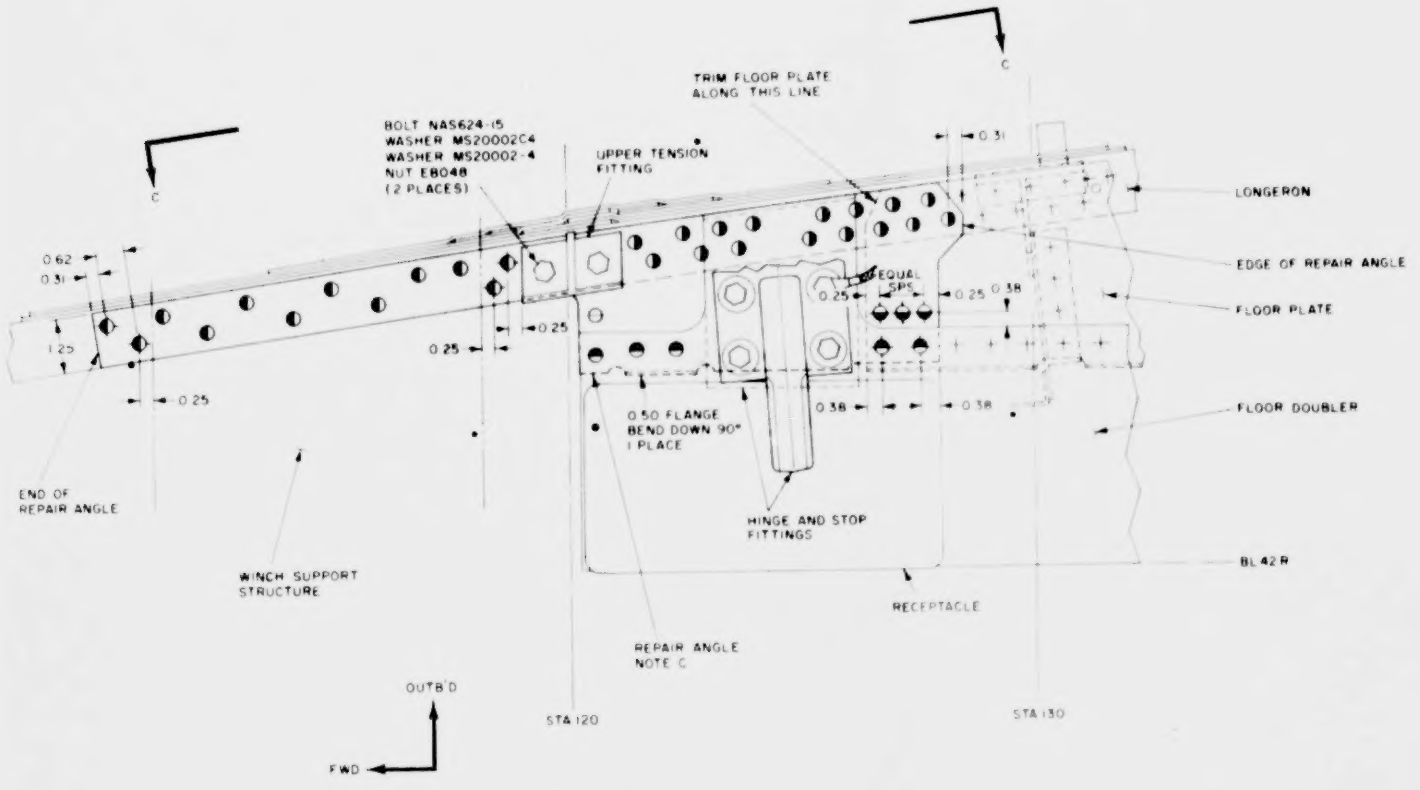
SECTION B-B

NOTES

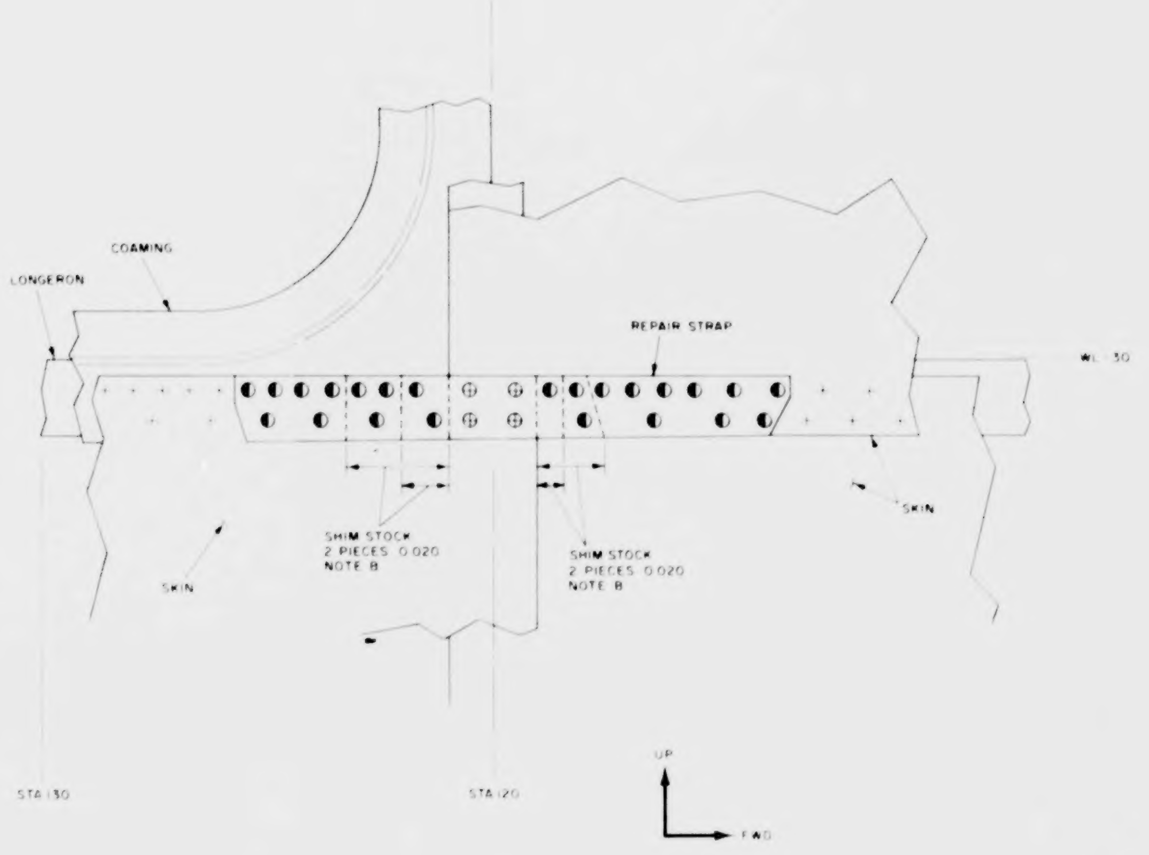
A. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
B. LENGTH AND WIDTH OF SHIMS TO MATCH EXISTING CONDITIONS
C. MAINTAIN FLOOR PLATE CONFIGURATION EXCEPT AS SHOWN
D. MAINTAIN FUSELAGE SEALING FOR WATERTIGHTNESS
E. MAINTAIN DISSIMILAR METAL CONTACT PROTECTION

RIVET LEGEND

○	DENOTES EXISTING LOCATION
◇	DENOTES NEW LOCATION
◐	BACRN15DN5AD
◑	NAS1097AD5
⊕	USAF 461-5
◒	USAF 461-4
◓	USAF 461-7
○	MS20470AD6


C
C
BOLT NAS624-15
WASHER MS20002C4
WASHER MS20002-4
NUT EB048
(2 PLACES)
UPPER TENSION FITTING
TRIM FLOOR PLATE ALONG THIS LINE
0.31
LONGERON
EDGE OF REPAIR ANGLE
FLOOR PLATE
FLOOR DOUBLER
0.62
0.31
1.25
0.25
0.25
0.25
0.25
EQUAL SPS
0.25
0.25
0.38
0.38
0.38
0.50 FLANGE BEND DOWN 90° 1 PLACE
END OF REPAIR ANGLE
WINCH SUPPORT STRUCTURE
HINGE AND STOP FITTINGS
BL 42R
RECEPTACLE
REPAIR ANGLE NOTE C
OUTB'D
FWD
STA 120
STA 130

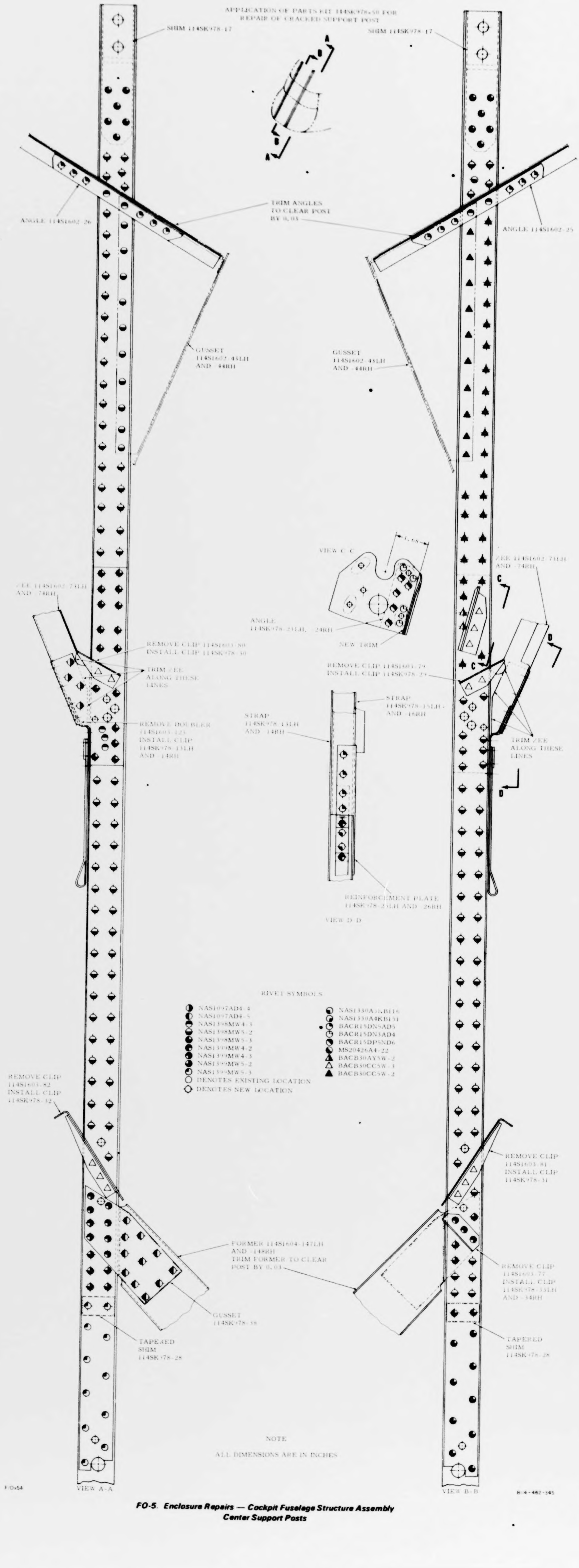
SECTION A-A


LONGERON
COAMING
REPAIR STRAP
WL -30
SHIM STOCK 2 PIECES 0.020 NOTE B
SHIM STOCK 2 PIECES 0.020 NOTE B
SKIN
SKIN
STA 130
STA 120
UP
FWD

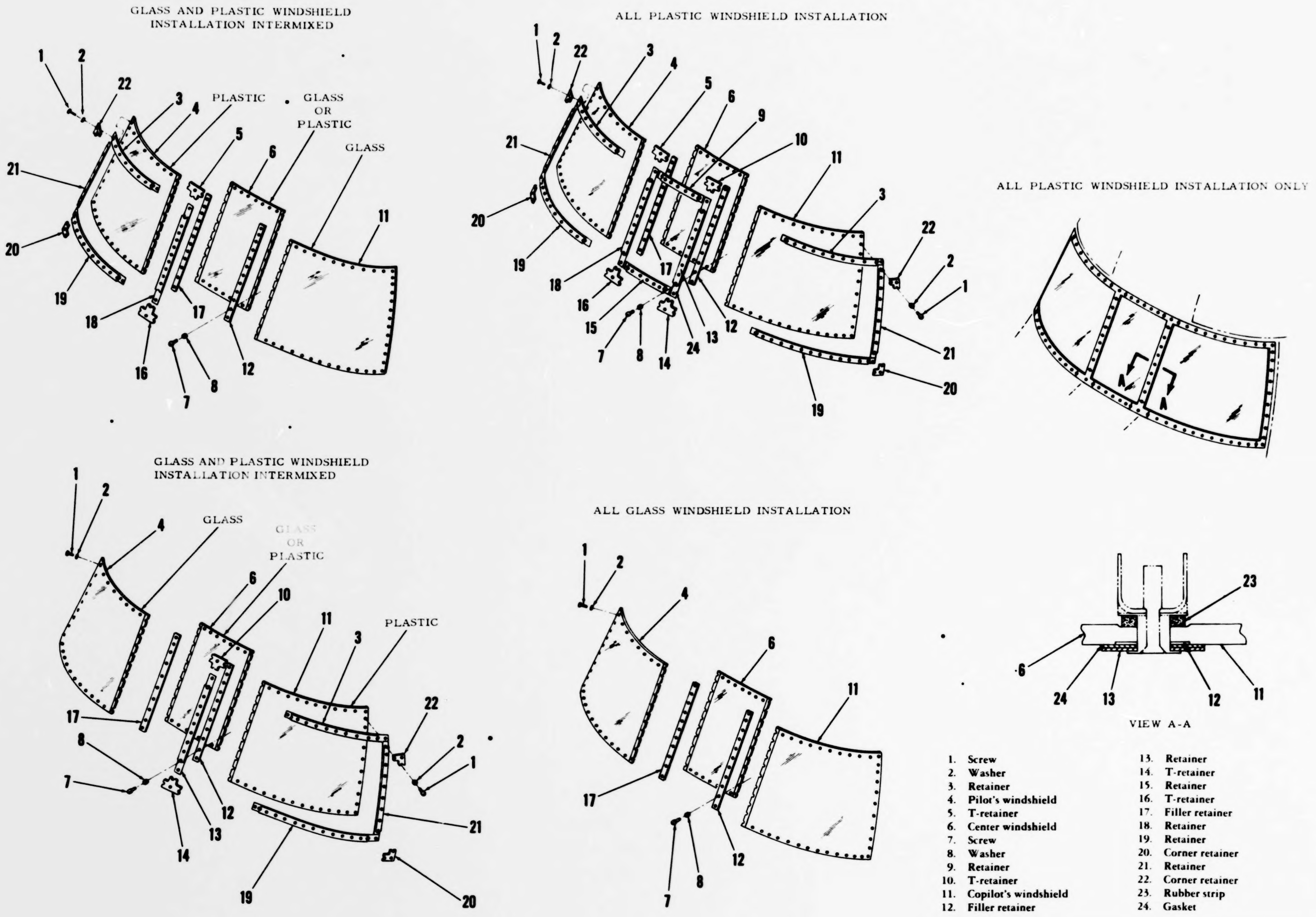
SECTION C-C

FO-4. Longeron Repairs—Cockpit Fuselage Structure Assembly

best copy available


APPLICATION OF PARTS KIT 114SK978-50 FOR
REPAIR OF CRACKED SUPPORT POST
SHIM 114SK978-17
SHIM 114SK978-17
A
B
B
A
ANGLE 114S1602-26
TRIM ANGLES
TO CLEAR POST
BY 0.03
ANGLE 114S1602-25
GUSSET
114S1602-43LH
AND -44RH
GUSSET
114S1602-43LH
AND -44RH
VIEW C-C
1.68
ANGLE
114SK978-23LH, -24RH
NEW TRIM
ZEE 114S1602-73LH
AND -74RH
ZEE 114S1602-73LH
AND -74RH
C
C
D
D
REMOVE CLIP 114S1603-80
INSTALL CLIP 114SK978-30
TRIM ZEE
ALONG THESE
LINES
REMOVE CLIP 114S1603-79
INSTALL CLIP 114SK978-29
REMOVE DOUBLER
114S1603-123
INSTALL CLIP
114SK978-13LH
AND -14RH
STRAP
114SK978-13LH
AND -14RH
STRAP
114SK978-15LH
AND -16RH
TRIM ZEE
ALONG THESE
LINES
REINFORCEMENT PLATE
114SK978-25LH AND -26RH
VIEW D-D
RIVET SYMBOLS
NAS1097AD4-4
NAS1097AD4-5
NAS1398MW4-3
NAS1398MW5-2
NAS1398MW5-3
NAS1399MW4-2
NAS1399MW4-3
NAS1399MW5-2
NAS1399MW5-3
DENOTES EXISTING LOCATION
DENOTES NEW LOCATION
NAS1330A3KB116
NAS1330A4KB151
BACR15DN5AD5
BACR15DN3AD4
BACR15DP5ND6
MS20426A4-22
BACB30AY5W-2
BACB30CC5W-3
BACB30CC5W-2
REMOVE CLIP
114S1603-82
INSTALL CLIP
114SK978-32
REMOVE CLIP
114S1603-81
INSTALL CLIP
114SK978-31
FORMER 114S1604-147LH
AND -148RH
TRIM FORMER TO CLEAR
POST BY 0.03
REMOVE CLIP
114S1603-77
INSTALL CLIP
114SK978-33LH
AND -34RH
GUSSET
114SK978-38
TAPERED
SHIM
114SK978-28
TAPERED
SHIM
114SK978-28
NOTE
ALL DIMENSIONS ARE IN INCHES
F/Ox54
VIEW A-A
VIEW B-B
B14-462-345

FO-5. Enclosure Repairs — Cockpit Fuselage Structure Assembly Center Support Posts


GLASS AND PLASTIC WINDSHIELD INSTALLATION INTERMIXED
PLASTIC
GLASS OR PLASTIC
GLASS
ALL PLASTIC WINDSHIELD INSTALLATION
ALL PLASTIC WINDSHIELD INSTALLATION ONLY
A
A
GLASS AND PLASTIC WINDSHIELD INSTALLATION INTERMIXED
GLASS
GLASS OR PLASTIC
PLASTIC
ALL GLASS WINDSHIELD INSTALLATION
VIEW A-A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

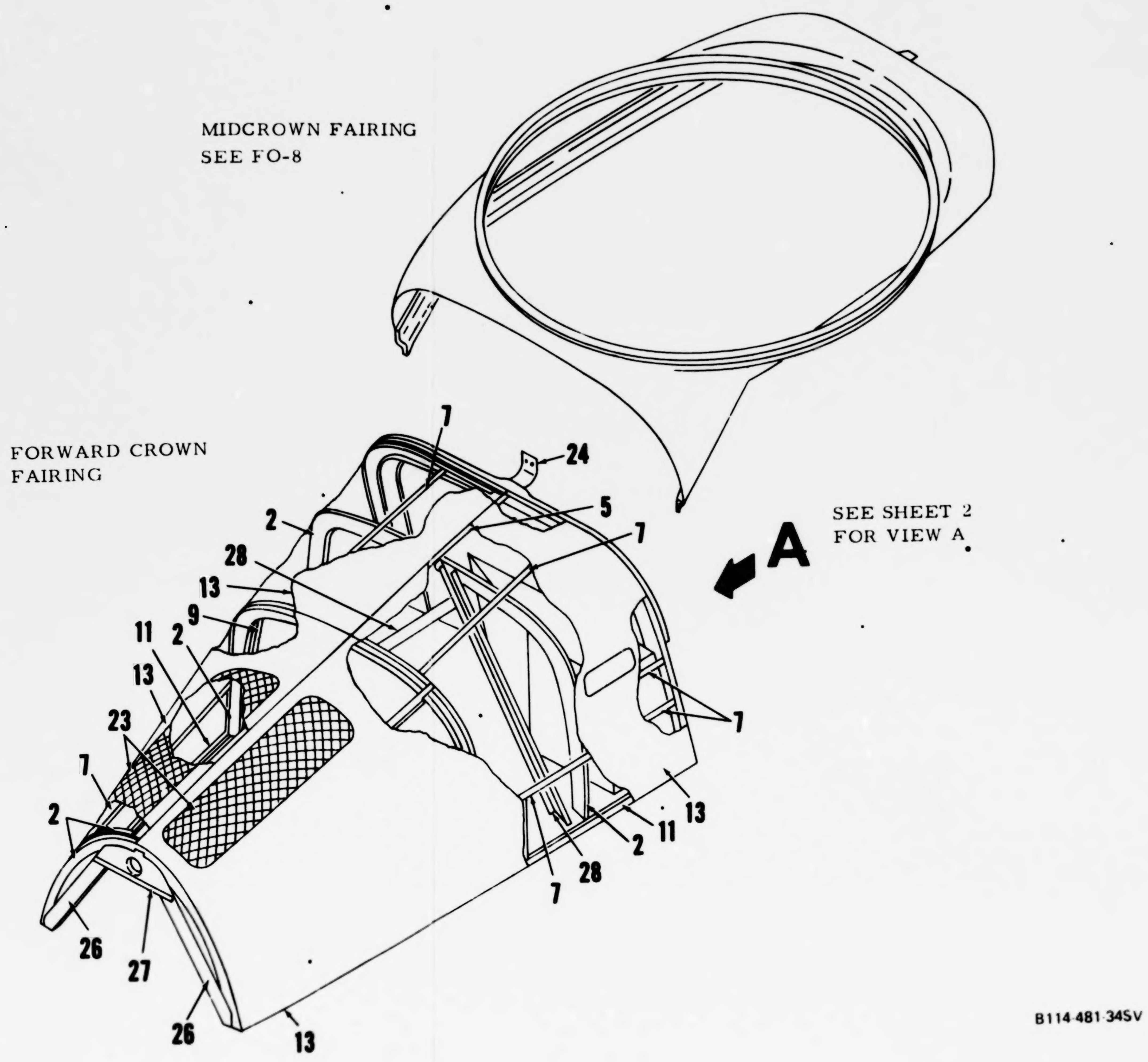
No.	Item
1.	Screw
2.	Washer
3.	Retainer
4.	Pilot's windshield
5.	T-retainer
6.	Center windshield
7.	Screw
8.	Washer
9.	Retainer
10.	T-retainer
11.	Copilot's windshield
12.	Filler retainer
13.	Retainer
14.	T-retainer
15.	Retainer
16.	T-retainer
17.	Filler retainer
18.	Retainer
19.	Retainer
20.	Corner retainer
21.	Retainer
22.	Corner retainer
23.	Rubber strip
24.	Gasket

FOx54

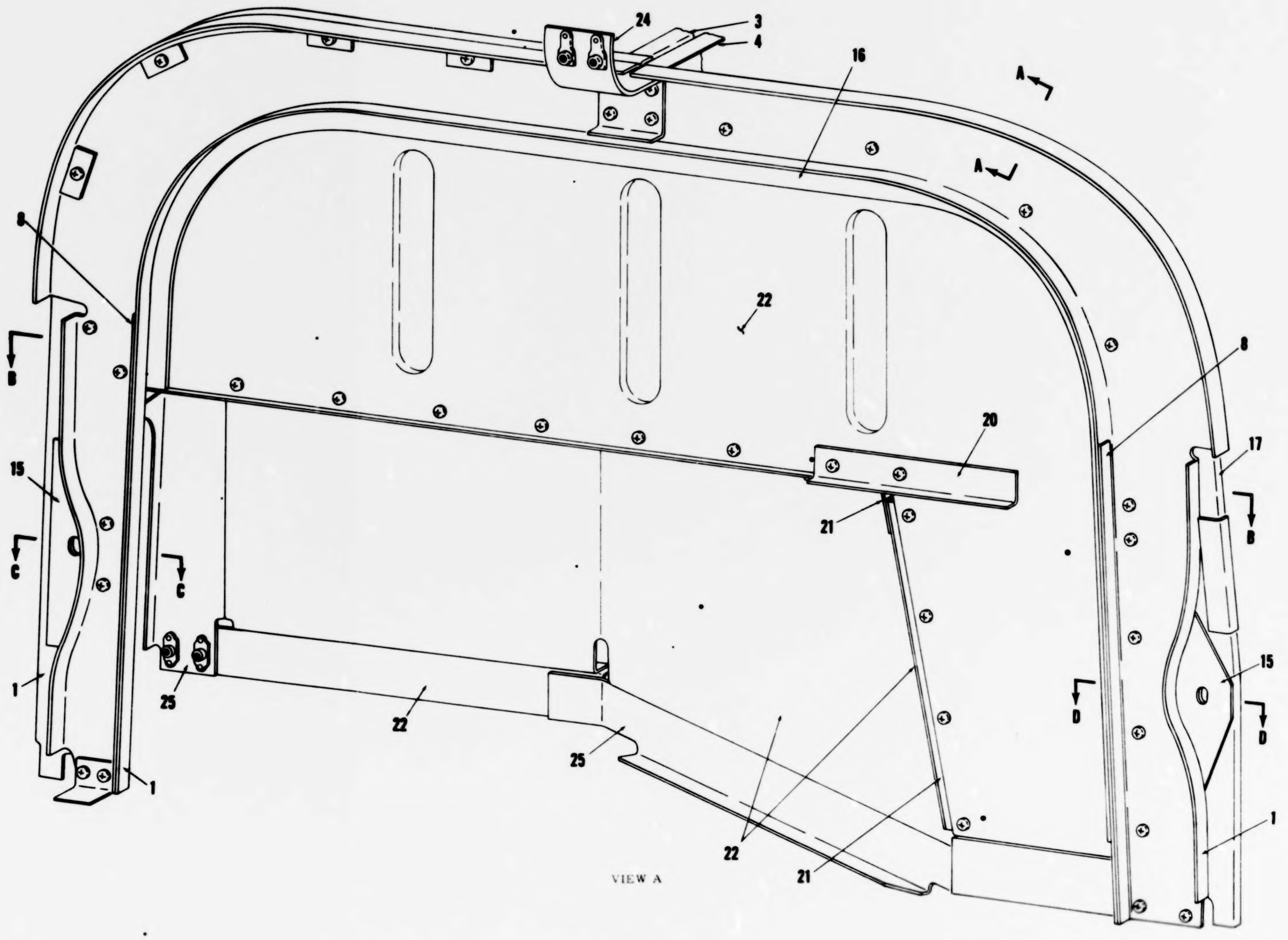
B114-310-208

FO-6. Windshield Installation

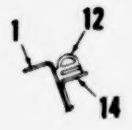
best copy available


MIDCROWN FAIRING
SEE FO-8
FORWARD CROWN
FAIRING
7
24
2
5
28
7
SEE SHEET 2
FOR VIEW A
A
13
9
11
2
13
7
23
7
2
13
11
2
28
7
26
27
26
13
B114 481 34SV

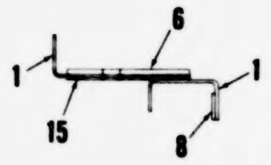
FO-7. Fairing Repairs—Aft Pylon Structure Assembly (Sheet 1 of 6)



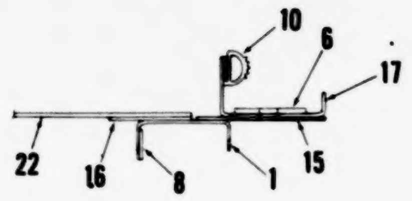
VIEW A



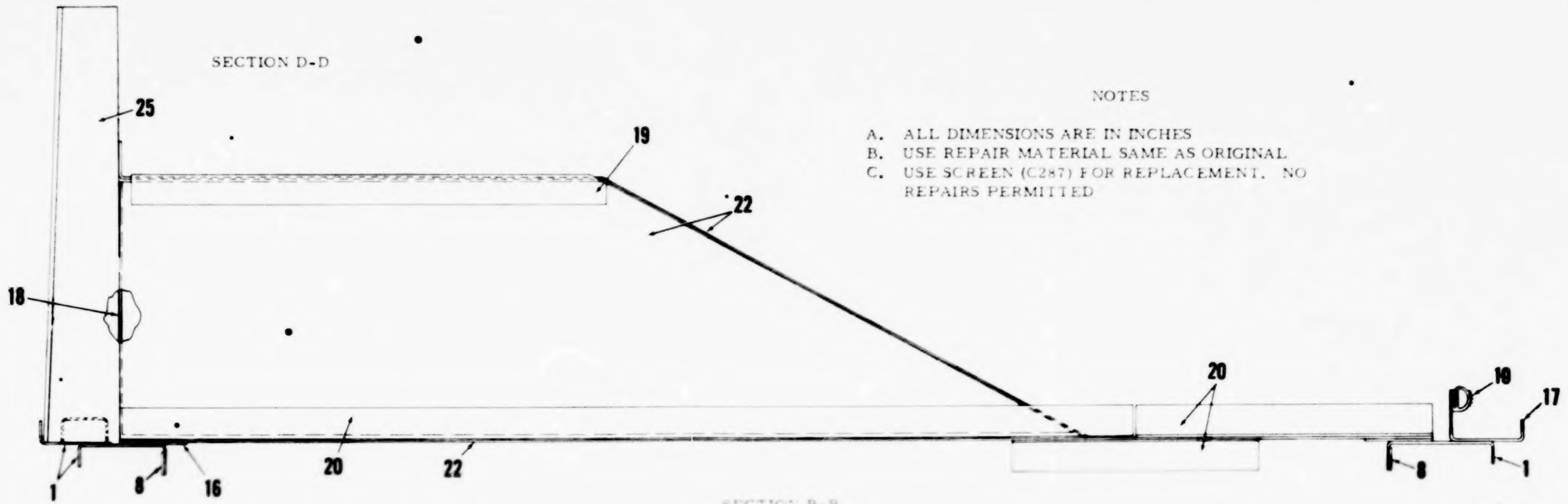
SECTION A-A



SECTION C-C



SECTION D-D



SECTION B-B

FORWARD CROWN FAIRINGS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FORMER	0.040 2024-T42 CLAD	0.040 301 CRES ANL	--
	FORMER	0.025 2024-T3 CLAD	0.032 2024-T3 CLAD	--
2	FORMER	0.025 2024-T42 CLAD	0.025 301 CRES ANL	--
	FORMER	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	--
3	BEAM	0.032 2024-T42 CLAD	0.032 301 CRES ANL	--
	BEAM	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
4	BEAM	0.025 2024-T42 CLAD	0.025 301 CRES ANL	--
	BEAM	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
5	HINGE	MS20001PH4	NOTE B.	--
6	PLATE	0.125 301 CRES ANL	0.125 301 CRES ANL	2-7
7	STIFFENER	VS70503-1	0.032 4130	--
8	STRAP	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
9	STRUT	0.035 RD SMLS TUBE 6061-T6	0.058 RD SMLS TUBE 6061-T6	2-18
10	SEAL	VS80540-1	NOTE B.	--
11	DOUBLER	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
12	SEAL	VS80518	NOTE B.	--
13	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
14	RETAINER	0.025 6061-T6 CLAD	0.032 4130	--
15	DOUBLER	0.020 301 CRES ANL	0.020 301 CRES ANL	2-7
16	DOUBLER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
17	FORMER	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
18	SEAL	0.050 SYN RUBBER	NOTE B.	--
19	ANGLE	BAC 1503-1420-7075-T6	0.040 4130	--
20	ANGLE	0.050 2024-T3 CLAD	0.063 2024-T3 CLAD	--
21	ANGLE	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
22	WEB	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	2-7
23	SCREEN	0.040 2024-T4 CLAD	NOTE C.	--
24	SPLICE	0.025 2024-T4 CLAD	0.025 2024-T4 CLAD	--
25	ZEE	0.040 2024-T3 CLAD	0.050 2024-T3 CLAD	--
26	CHANNEL	0.050 2024-T3 CLAD	0.050 2024-T3 CLAD	--
27	GUSSET	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
28	CHANNEL	0.063 2024-T3 CLAD	0.063 2024-T3 CLAD	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. USE REPAIR MATERIAL SAME AS ORIGINAL
C. USE SCREEN (C287) FOR REPLACEMENT. NO REPAIRS PERMITTED

FOx54

8114-466-345V

FO-7. *Fairing Repairs—Aft Pylon Structure Assembly (Sheet 2 of 6)*

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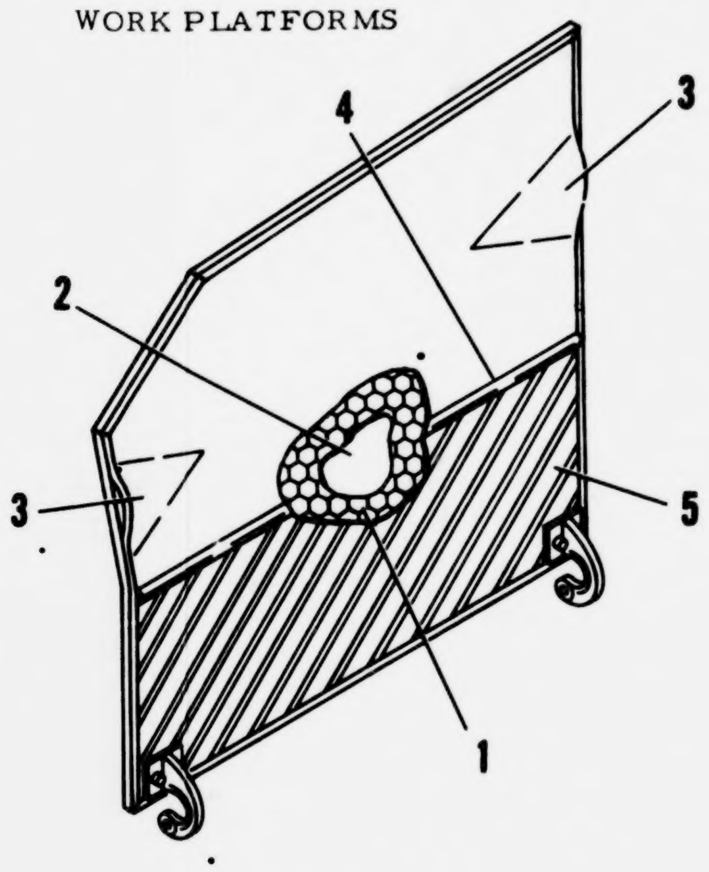


INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	CORE	0.590, 2.3-1/4-10N3003	NOTE C
2	SKIN	0.016 2024-T4 CLAD	0.020 2024-T3 CLAD
3	COVER	4 PLY, NO. 181 GLASS CLOTH	NOTE B.
4	ANGLE	0.032 7075-T6 BARE	0.040 4130
5	TREAD SHEET	0.025 2024-T4 CLAD	NOTE C.

NOTES

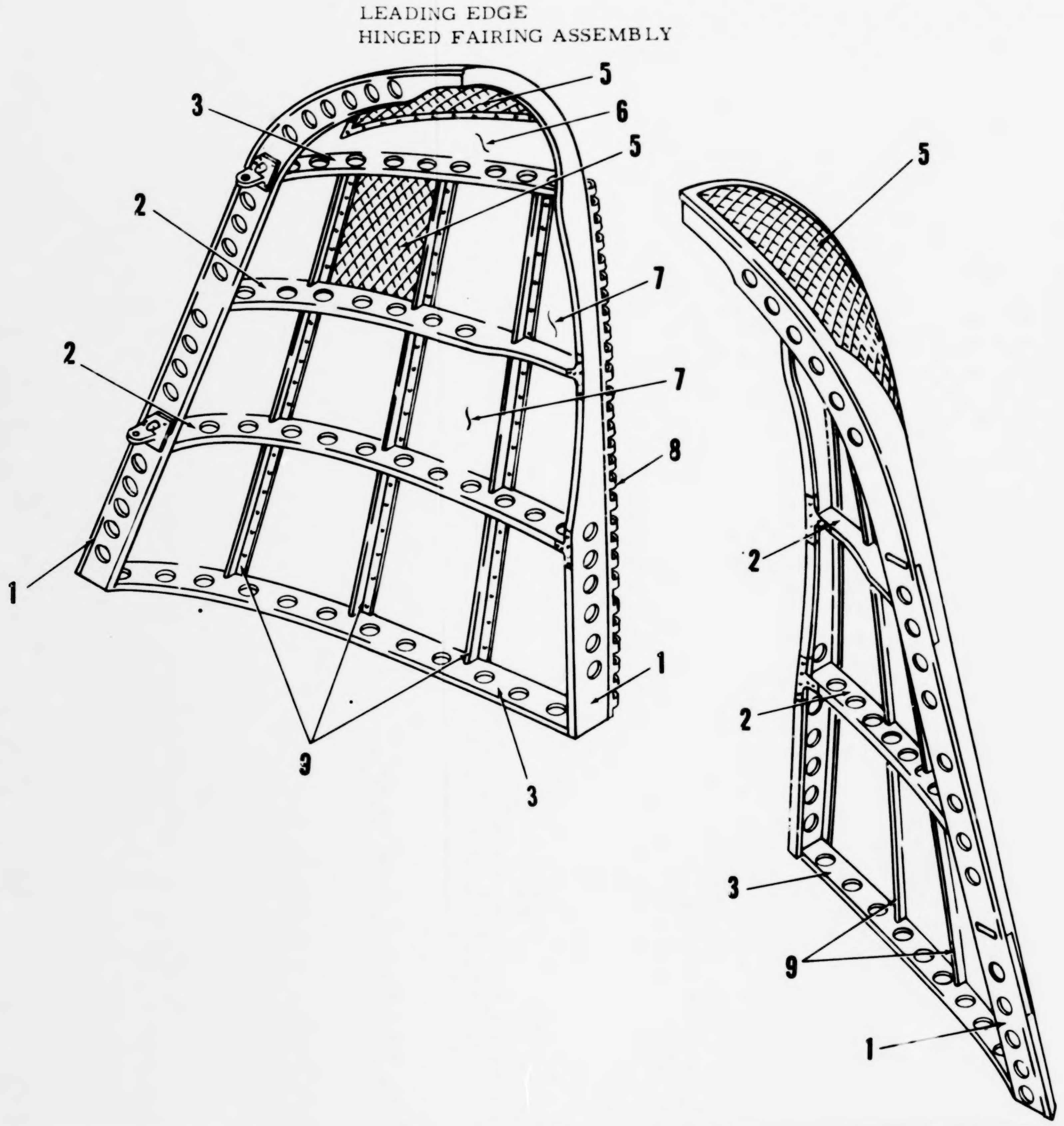
A. ALL DIMENSIONS ARE IN INCHES

B. MODIFY IN ACCORDANCE WITH MWO 55-1500-210-40/2

C. REFER TO TM 55-1500-204-25/1 FOR CLASSIFICATION OF DAMAGE AND TYPES OF REPAIR

B114-262-34SV ②

FO-7. Fairing Repairs—Aft Pylon Structure Assembly (Sheet 3 of 6)



INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FORMER	0.025 2024-T4 CLAD	NOTE C	--
2	FORMER	0.040 7075-T6 BARE	0.050 7075-T3 CLAD	--
3	FORMER	0.025 7075-T6 BARE	0.032 7075-T3 CLAD	--
4	STIFFENER	JS70503-1	0.032 4130	--
5	SCREEN	0.040 2024-T4 CLAD	NOTE D.	--
6	SKIN	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	2-7
7	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
8	HINGE HALF	MS 20001		--
9	STIFFENER	VS70503-1	0.032 4130	--

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. HEAT TREAT REPAIR MATERIAL TO ORIGINAL MATERIAL TEMPER AFTER FORMING

C. SEE FO-7 SHEET 5 FOR REPAIRS

D. USE SCREEN (C287) FOR REPLACEMENT. NO REPAIRS PERMITTED

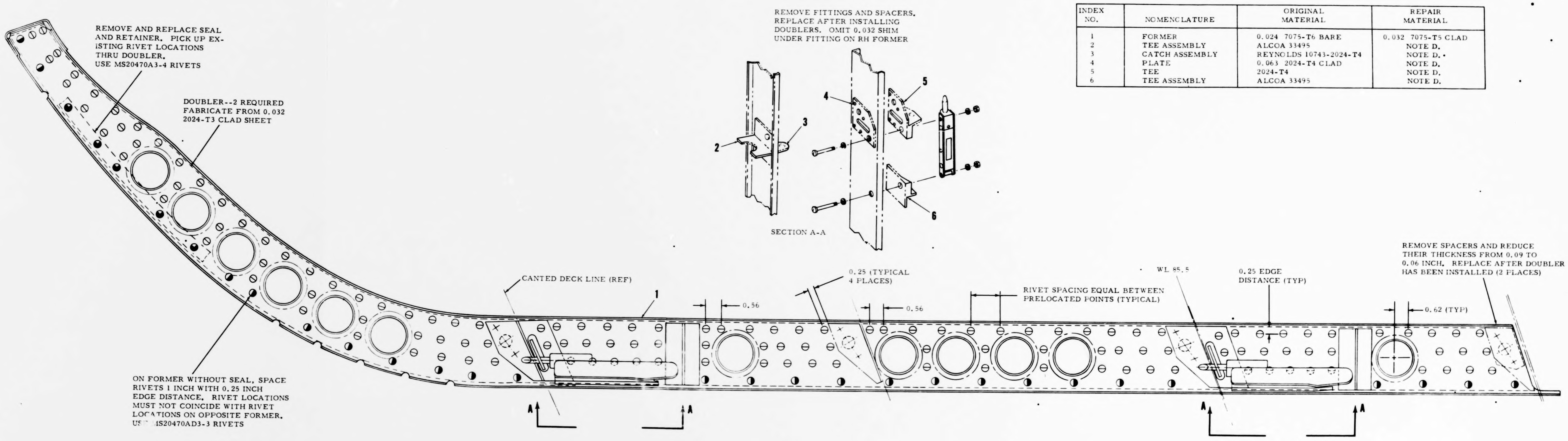
42x54

B114-608-34SV

FO-7. Fairing Repairs—Aft Pylon Structure Assembly (Sheet 4 of 6)

REPAIR OF AFT PYLON LEADING EDGE HINGED FAIRING

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	FORMER	0.024 7075-T6 BARE	0.032 7075-T5 CLAD
2	TEE ASSEMBLY	ALCOA 33495	NOTE D.
3	CATCH ASSEMBLY	REYNOLDS 10743-2024-T4	NOTE D.
4	PLATE	0.063 2024-T4 CLAD	NOTE D.
5	TEE	2024-T4	NOTE D.
6	TEE ASSEMBLY	ALCOA 33495	NOTE D.



REMOVE FITTINGS AND SPACERS. REPLACE AFTER INSTALLING DOUBLERS. OMIT 0.032 SHIM UNDER FITTING ON RH FORMER

SECTION A-A

REMOVE AND REPLACE SEAL AND RETAINER. PICK UP EXISTING RIVET LOCATIONS THRU DOUBLER. USE MS20470A3-4 RIVETS

DOUBLER--2 REQUIRED FABRICATE FROM 0.032 2024-T3 CLAD SHEET

ON FORMER WITHOUT SEAL, SPACE RIVETS 1 INCH WITH 0.25 INCH EDGE DISTANCE. RIVET LOCATIONS MUST NOT COINCIDE WITH RIVET LOCATIONS ON OPPOSITE FORMER. USE MS20470AD3-3 RIVETS

CANTED DECK LINE (REF)

0.25 (TYPICAL 4 PLACES)

RIVET SPACING EQUAL BETWEEN PRELOCATED POINTS (TYPICAL)

0.25 EDGE DISTANCE (TYP)

REMOVE SPACERS AND REDUCE THEIR THICKNESS FROM 0.09 TO 0.06 INCH. REPLACE AFTER DOUBLER HAS BEEN INSTALLED (2 PLACES)

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. ALL RIVETS ARE MS20470AD4-3 UNLESS OTHERWISE NOTED

C. HEAT TREAT MATERIAL TO ORIGINAL MATERIAL TEMPER AFTER FORMING

D. REPAIR NOT PRACTICAL FABRICATE REPLACEMENT

B114-392-345V

FO-7. Fairing Repairs—Aft Pylon Structure Assembly (Sheet 5 of 6)

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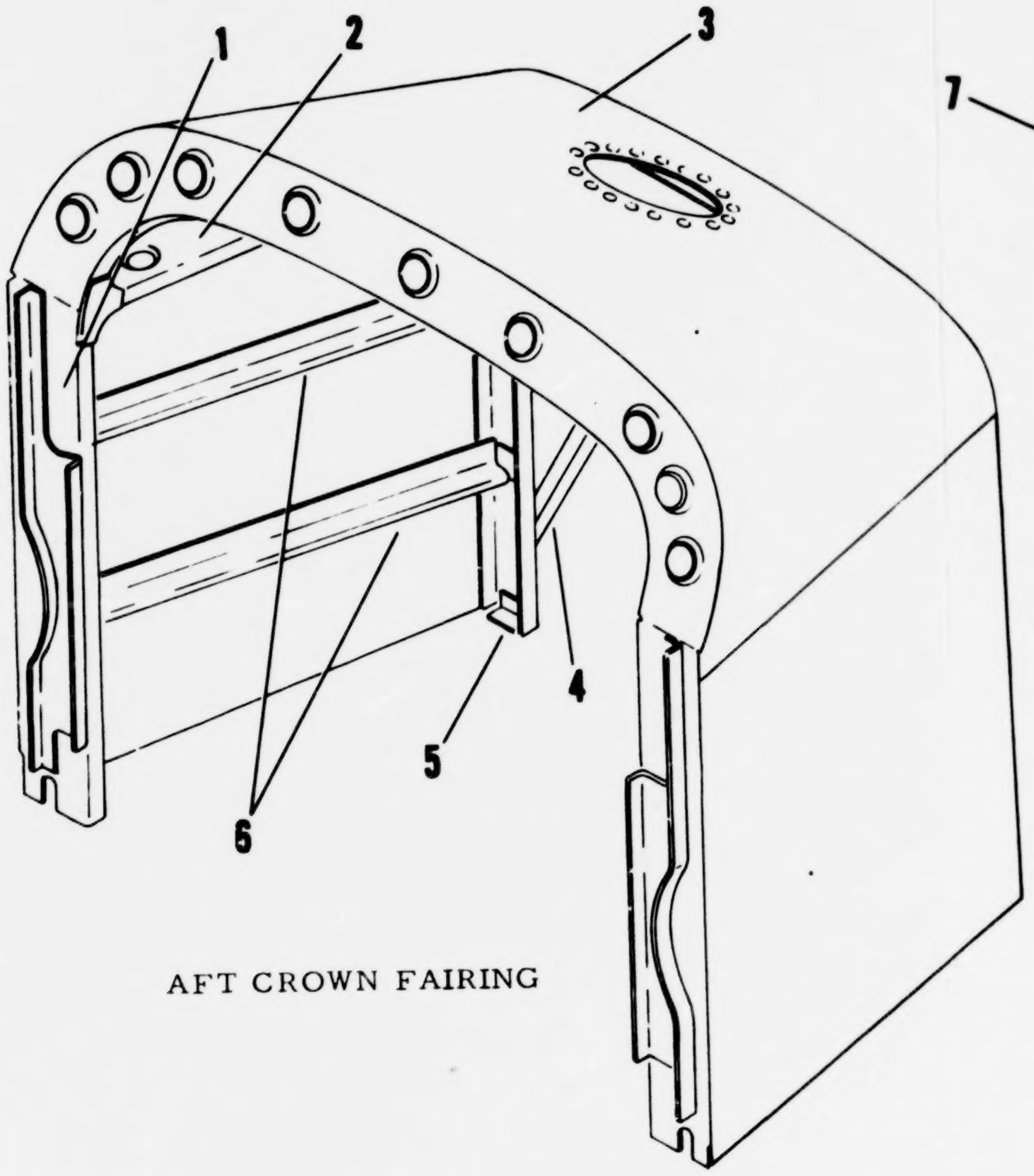
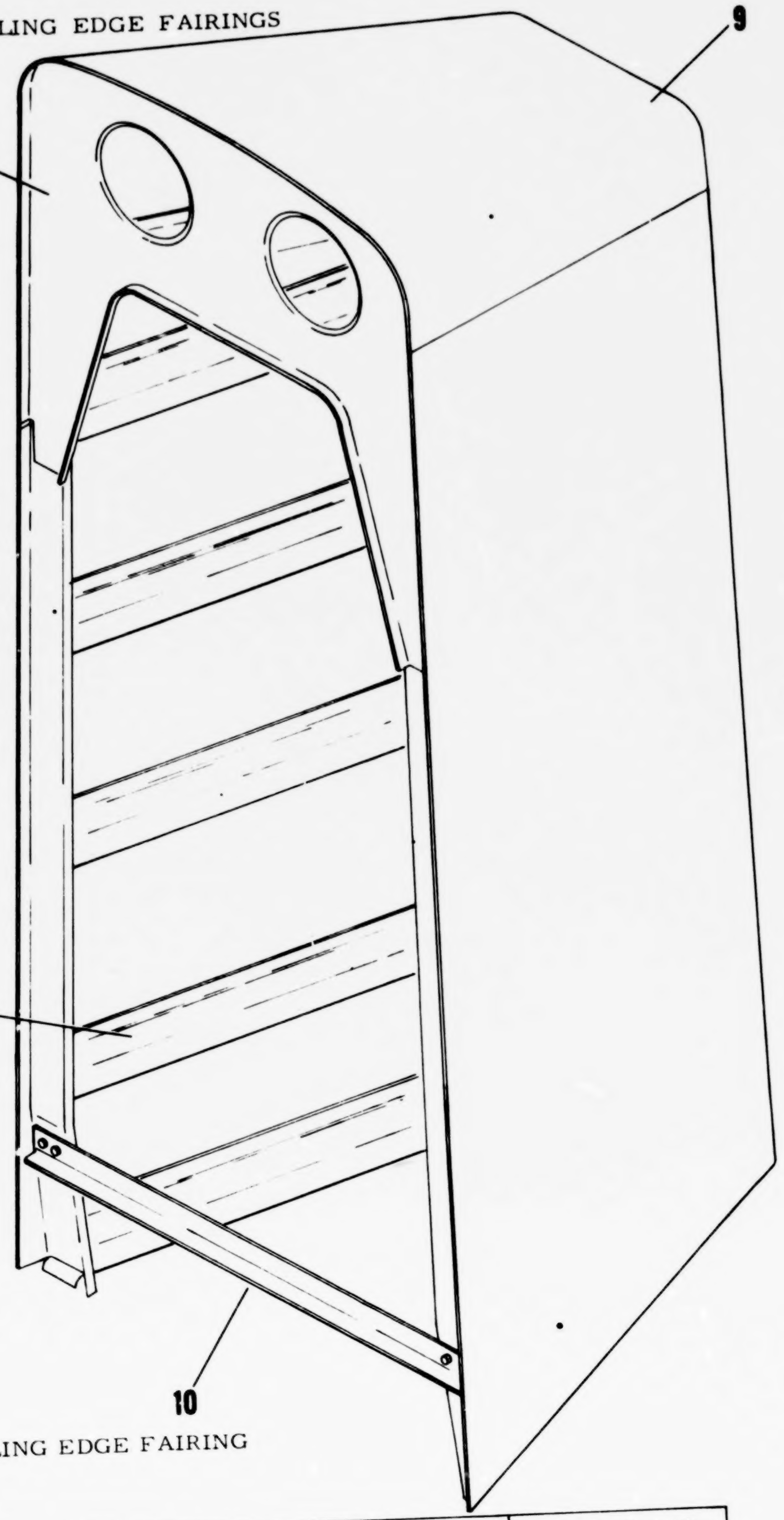
AFT CROWN AND TRAILING EDGE FAIRINGS



AFT CROWN FAIRING



TRAILING EDGE FAIRING

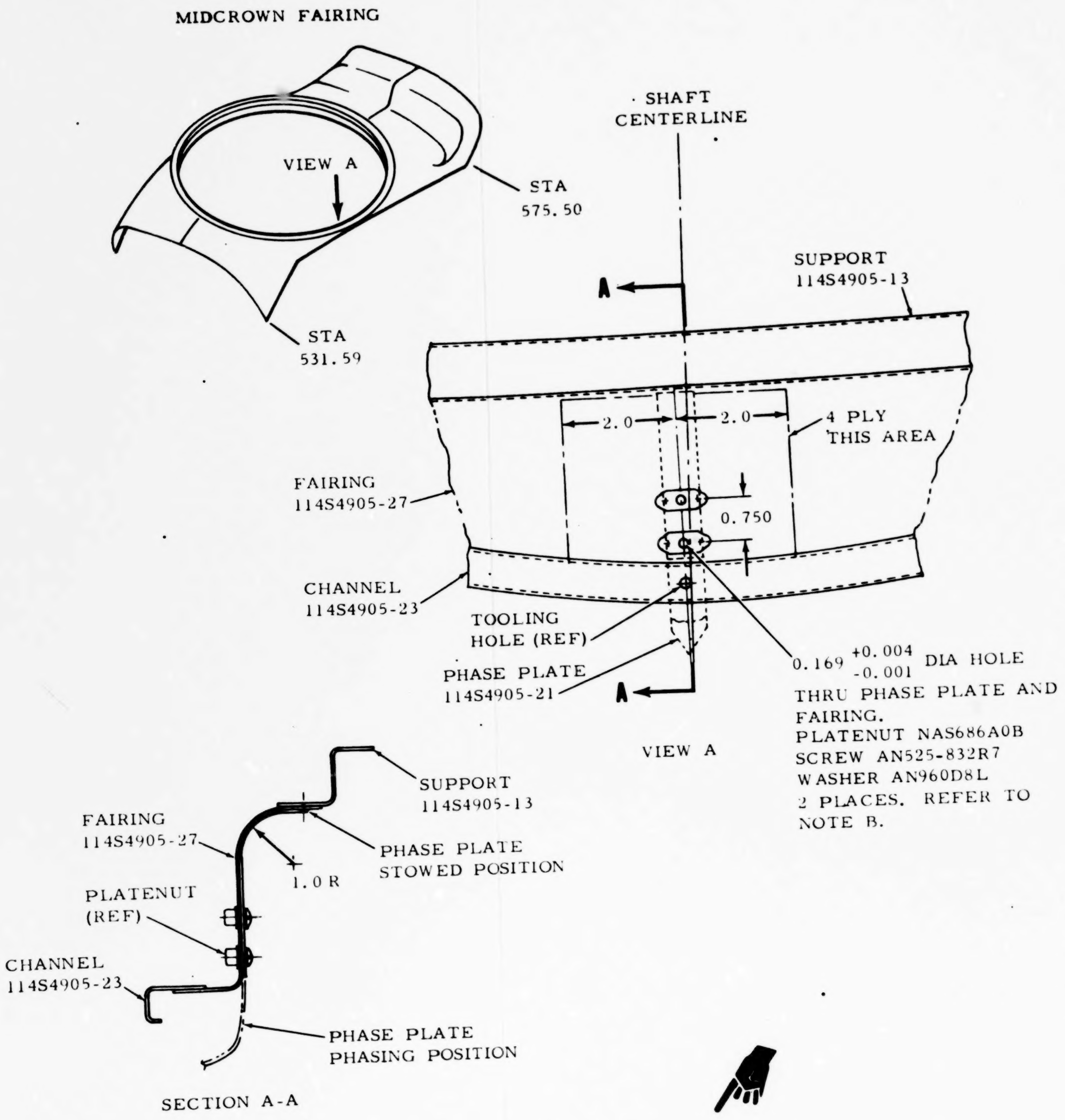
NOTES

A. ALL DIMENSIONS ARE IN INCHES
B. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR CLASSIFICATION OF DAMAGE AND REPAIR OF IMPREGNATED CLASS CLOTH PARTS

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL	REPAIR FIG.
1	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
2	FORMER	0.025 2024-T4 CLAD	0.032 2024-T3 CLAD	--
3	SKIN	0.020 2024-T4 CLAD	0.025 2024-T3 CLAD	2-7
4	STIFFENER	ALCOA 10854 2024-T4	0.050 4130	--
5	FORMER	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD	--
6	STIFFENER	BAC1517-1522 7075-T6	0.040 4130	--
7	FORMER	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD	--
8	FORMER	4-PLY, NO. 181/75 GLASS CLOTH	REFER TO NOTE B.	--
9	SKIN	3-PLY, NO. 181/75 GLASS CLOTH	REFER TO NOTE B.	--
10	STIFFENER	ALCOA 22526 2024-T4	0.050 4130	--

B114-263-34SMV

FO-7. Fairing Repairs—Aft Pylon Structure Assembly (Sheet 6 of 6)


MIDCROWN FAIRING
VIEW A
STA 575.50
STA 531.59
SHAFT CENTERLINE
A
SUPPORT 114S4905-13
2.0
2.0
4 PLY THIS AREA
FAIRING 114S4905-27
0.750
CHANNEL 114S4905-23
TOOLING HOLE (REF)
PHASE PLATE 114S4905-21
A
0.169 +0.004 -0.001 DIA HOLE THRU PHASE PLATE AND FAIRING.
PLATENUT NAS686A0B
SCREW AN525-832R7
WASHER AN960D8L
2 PLACES. REFER TO NOTE B.
VIEW A
SUPPORT 114S4905-13
FAIRING 114S4905-27
PHASE PLATE STOWED POSITION
1.0 R
PLATENUT (REF)
CHANNEL 114S4905-23
PHASE PLATE PHASING POSITION
SECTION A-A

NOTES

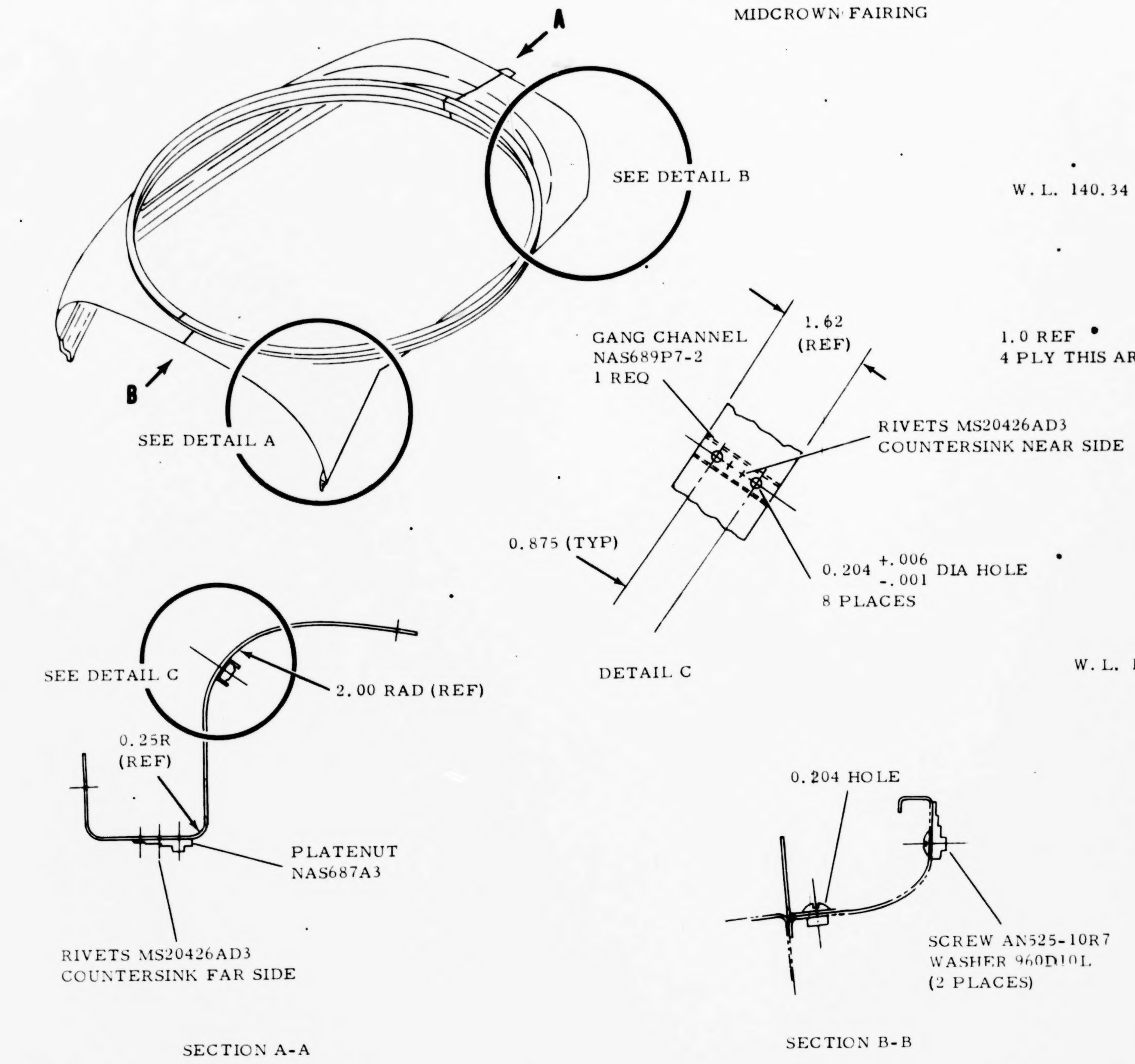
A. ALL DIMENSIONS ARE IN INCHES

B. POSITION ONE OF THE THREE CLEVISES ON THE ROTATING RING OF THE CONTROLLABLE SWASHPLATE (ATTACHMENT FOR THE LOWER END OF PITCH LINK) SO THAT IT IS CENTERED DIRECTLY OVER THE CLEVIS ON THE STATIONARY RING (ATTACHMENT FOR THE SWIVELING ACTUATOR). THIS WILL POSITION THE PHASING RIVET ON THE RAINSHIELD WITH RESPECT TO THE LOCATION OF THE POINTED END OF THE PHASE PLATE. PLACE THE PHASE PLATE ON THE ANGLE 114S1902-453 AND LOCATE THE ATTACHING HOLES.

B114-564-34 SJ

42 x 54

FO-8. *Midcrown Fairing Repairs—Aft Pylon Structure Assembly (Sheet 1 of 2)*



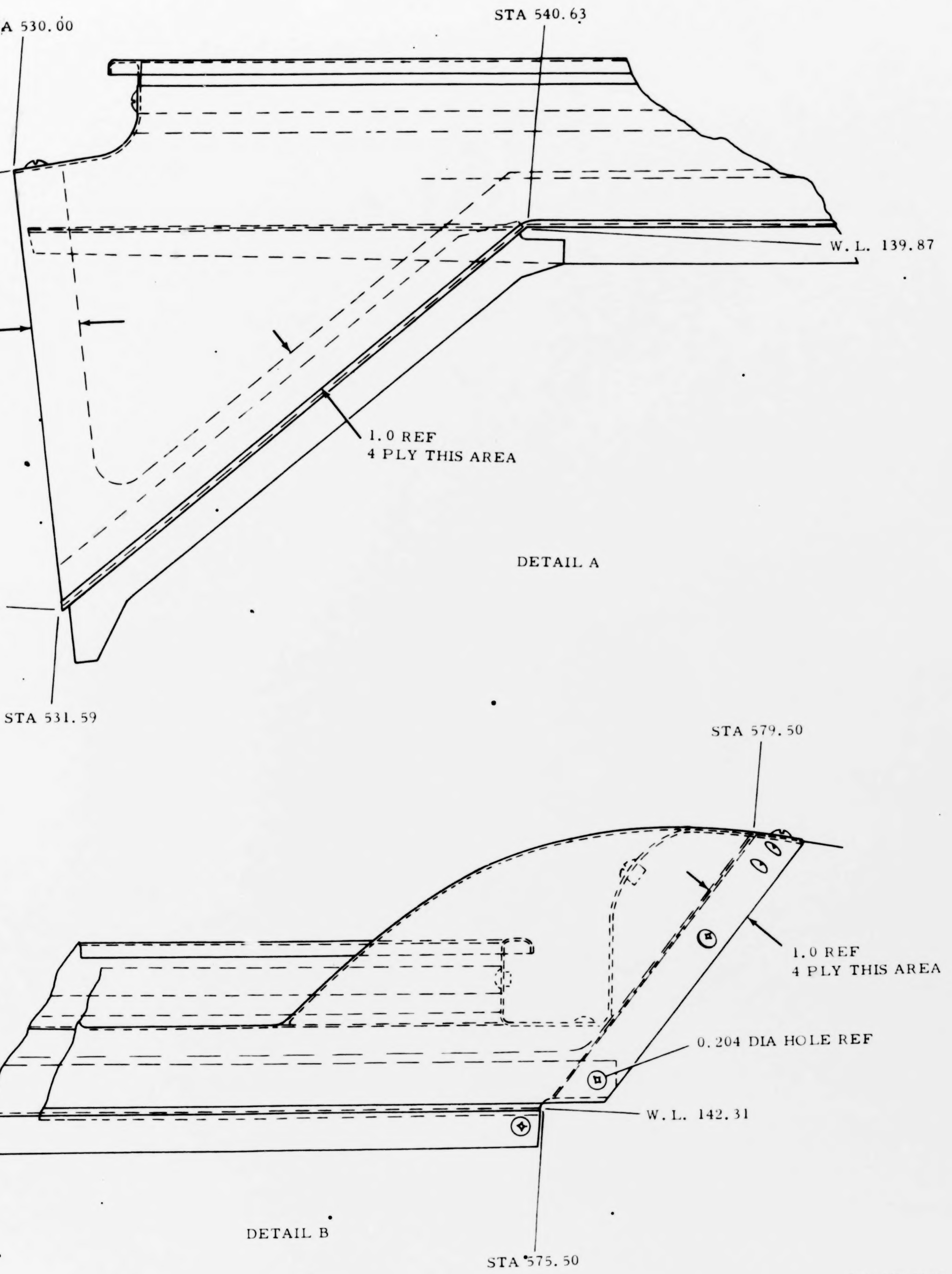
MIDCROWN FAIRING

DETAIL C

SECTION A-A

SECTION B-B

A
B
SEE DETAIL B
SEE DETAIL A
GANG CHANNEL
NAS689P7-2
1 REQ
1.62
(REF)
RIVETS MS20426AD3
COUNTERSINK NEAR SIDE
0.875 (TYP)
0.204 +.006 -.001 DIA HOLE
8 PLACES
SEE DETAIL C
2.00 RAD (REF)
0.25R
(REF)
PLATENUT
NAS687A3
RIVETS MS20426AD3
COUNTERSINK FAR SIDE
0.204 HOLE
SCREW AN525-10R7
WASHER 960D10L
(2 PLACES)



DETAIL A

DETAIL B

STA 530.00
STA 540.63
W. L. 140.34
W. L. 139.87
1.0 REF
4 PLY THIS AREA
1.0 REF
4 PLY THIS AREA
W. L. 131.36
STA 531.59
STA 579.50
1.0 REF
4 PLY THIS AREA
0.204 DIA HOLE REF
W. L. 142.31
STA 575.50

INDEX NO.	NOMENCLATURE	ORIGINAL MATERIAL	REPAIR MATERIAL
1	SUPPORT	0.040 2024-T4 CLAD	0.050 2024-T3 CLAD
2	CHANNEL	0.032 2024-T4 CLAD	0.040 2024-T3 CLAD
3	SPLICE PLATE	0.025 2024-T4 CLAD	0.025 2024-T4 CLAD
4	GANG CHANNEL	NAS689P7-2	NAS689P7
5	FAIRING	2 PLY, NO. 181 GLASS CLOTH	

NOTES

A. ALL DIMENSIONS ARE IN INCHES

B. REFER TO TM 55-1500-204-25/1 AND TB 746-93-2 FOR CLASSIFICATION OF DAMAGE AND REPAIR OF IMPREGNATED GLASS CLOTH PARTS

F/O x 54

B114-607-34SV

FO-8. Midcrown Fairing Repairs—Aft Pylon Structure Assembly (Sheet 2 of 2)

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